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Sulphur Gas in the Treatment of Mange

By MM. LÉPINAY, VIGEL and CHOLLET
Translated for the American Expeditionary Force.

(*Continued from page 217, May issue*)

THE chamber is composed of the ten stalls indicated. They are juxtaposed, partitioned with jointed boards and have the following dimensions: 6.5 feet high in front, 5.75 behind, 2.6 feet wide and 5.75 long. These dimensions should be considered as the maximum. It is better to have them small, permitting the employment of just the amount of gas necessary to obtain the amount and percentage required in the minimum time as well as to limiting the movements of the animals. Behind each stall is a ventilating door to permit rapid ventilation when desired. In the front door, one for each stall, is a window 31 inches by 23 inches for the horses' heads. A hood of canvas fixed to the window frames and tightened around the horses' necks prevents them from being harmed by the gas. The hood has two bulges to fill up the jugular grooves and thus prevent the escape of gas from that level.

The stall partitions are straight instead of oblique from before backward. Two planks a foot wide would be sufficient. They should be removable so that refractory horses could be led into the chamber and turned around instead of backed in as recommended. And there should be a safety bar behind the horse as well as in front, to protect the weak back wall of the chamber but especially, by being adjustable, to crowd all horses of different sizes forward to the same level.—Translator.)

Operation of the sulphuration chamber. The front doors and the ventilating doors in the rear are opened wide. The horses are backed into the stalls and the safety bar is placed across their breasts to keep them from escaping forward. The front door is then slowly and carefully closed, passing the head through the hood which is then tightened around the neck. (The hood is now made to encircle the head in front of the ears.—Translator.) The halters are then tied to the rings on the manger (containing oats) before them. (We have found that feeding the animals is more harmful than beneficial because the motion of the jaws disturbs the hood, and therefore recommend that feeding be discontinued.—Translator.) When the horses are all in place the rear doors are closed and the sulphuration begins.

The animals are exposed to the gas for two hours. (This has been reduced to one hour and a half.—Translator.) When the operation is over the gas is allowed to escape (by opening the rear doors.—Translator) and when it has nearly all disappeared the hoods are loosened, the doors opened and the safety bar raised. The animals leave in the forward direction without any difficulty and without inhaling any gas. (It

is important to aerate the chamber well before loosening the hoods as the outrush of gas disturbs the animals and may cause accidents.—Translator.)

Need of the hood. The hood was adopted in order to completely enclose the animals in the sulphuration chamber with an isolation mask. The concentration of the gas and the need of watching the animals closely during the whole operation necessitates its use. In this connection it gives entire satisfaction. It is sufficiently elongated to give freedom to the head. Its dimensions are: 2.6 ft. long and 8.5 feet in circumference. (Instead of being of even caliber throughout its length the hoods should be cone-shaped to reduce the amount of folded fabric where it tightens around the head.—Translator.)

Treatment of the Head and Neck

While it is possible to use a respiratory mask the hood enables the animals to breath outside and also prevents the gas from reaching the head and the extremity of the neck. In order that these regions may also receive treatment, the horses on being removed from the chamber are given a good rubbing with cresylated oil, one part in ten, preferably with a stiff brush, and further to destroy the psoroptes in the external ear, conforming to the directions of *M. le vétérinaire aide-major* Henry, we introduce a three per cent emulsion of the same oil into the auditory conduit. The horses do not object to this and it can be done easily and quickly. The treatment of the head and neck should be done with great care. In fact the only relapses we have had were in those regions not reached by the gas, but these cases have always yielded to a second treatment of cresylated oil.

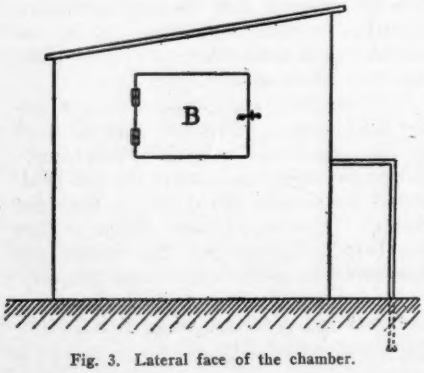

Fig. 3. Lateral face of the chamber.

Technic of the Treatment in Groups

From the results of our experiences since we began the treatment we have adopted the following technic: (1) Clipping. (2) Washing with a solution of sodium carbonate and soft soap, rubbing the solution in well with a fiber brush. (3) Sulphuration when the skin is dry, which is usually the next day, Each group of ten horses is submitted to the action of the gas for two hours. The generator enables one to get a sufficient concentration rapidly and it raises the temperature of the chamber 30°. As the concentration of the gas is necessary so is the elevation of the temperature of the gas mixture an essential part of the treatment. We have not had a single accident during the treatment of five hundred horses. (4) Care of the head, neck and ears when the animals leave the chambers. (Since the hood is now extended over the ears, the ear treatment may be omitted.—Translator.)

To obtain lasting results and prevent relapses it is essential to take the following precautions: (1) Immediately after the treatment supply the animals with carefully disinfected halters. (2) Put them in immaculately disinfected stables. (3) Give them regular grooming to facilitate the elimination of the epidermic debris and to restore the skin to a normal condition. (4) The grooming may be advantageously accompanied by several washings. (5) Disinfect with great care all grooming tools, harness, etc. (6) If in spite of these precautions some relapses occur, the treatment re-applied suffices to cure them.

This method has given conclusive results. In fact, at the present time (May, 1917) of the five hundred cases treated two hundred were evacuated as serviceable (one hundred and twenty-five during the same month). The others although cured were still unserviceable from other causes.

Conclusions Confirm Previous Reports

The aggregate of our experiences and the successes obtained since we began the treatment in groups enables us to submit

the following conclusions which again confirm our preceding reports:

The treatment of mange in horses with sulphur anhydrid is efficacious, simple, harmless, rapid and economical:

1. *It is efficacious.* In short, in a few days the specific symptoms of mange disappear and the skin takes on a normal appearance.

2. *It is simple.* No specialized personnel is necessary to apply it, because the animal is absolutely saturated with a bath of sulphur gas.

3. *It is harmless.* Not a single horse treated has been harmed by the gas.

4. *It is rapid.* The two hours' sulphuration and the two washings is sufficient to cure them, and all this can be given in a week. Forty horses can be treated in one day. These results are therefore important.

5. *It is economical* from several standpoints: (1) because it cures in the minimum time; (2) because it does not injure the health of the animals; (3) because it restores them rapidly to a normal condition and thus decreases the period of their unserviceability; (4) because all of the animals treated are cured. (5) because it requires no complicated apparatus; and (6) because the cost of treatment is only 15 cents per animal.

We have treated nine cases of tinea in the same manner as for mange and the results have been satisfactory.

As we have stated before lice and their ova are radically cured without a single recurrence by one sulphuration of twenty-five minutes.

Improvement in Technic

An improvement in the technic was made after the issuing of the first reports obliging us to make important changes as regards the use of the hood. Formerly we encircled the neck with a collar with two bulges to fit the jugular grooves and tightened this around the hood. After sulphuration it was necessary to rub the head and the extremity of the neck with cresylated oil and to subject the conduit of the ear to careful treatment. The new plan enables us to simplify the treatment of these regions. The collar with the two bulges is abolished. The hood is extended forward in front of the ears. The neck, the parotid region, the ear and the auditory conduit are submitted to the action of the gas, leaving the remaining parts of the head for the additional treatment of cresylated oil.

The leather halter, too thick to allow the hood to fit snugly, is replaced with a web halter. The gas does not irritate the eyes despite their proximity.

Furthermore, to give more liberty to the head the hood was lengthened from 2.6 ft. to 3.6 ft. on the upper part. These modifications eliminate irritation

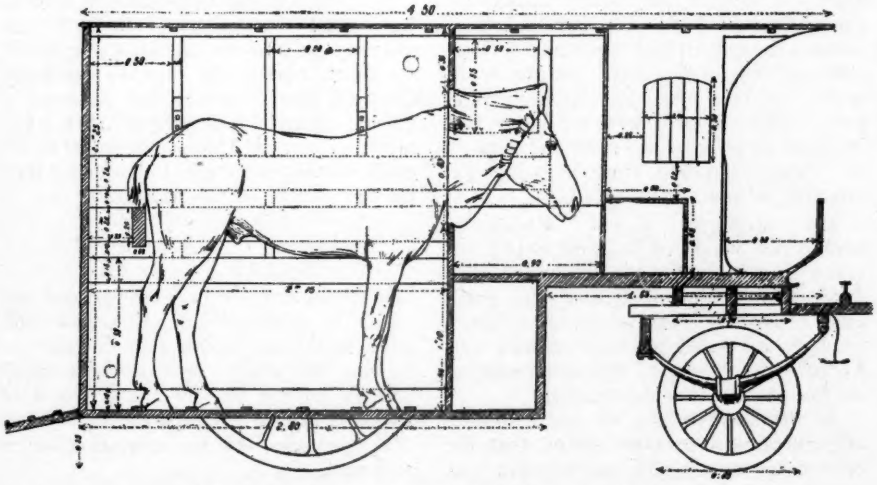

Fig. 5. Movable apparatus for giving the gas treatment.

and have the following advantages: (1) The action of the gas upon the regions not reached by the other method reduces the care required on those regions. (2) The saving of 50 per cent in cresylated oil is effected. (3) Less time is needed.

While the animals are in the chamber their halters are well disinfected.

At the same time that we introduced the above modifications *M. la véterinaire aide-major* Demora, in charge of the 19th *train des équipages,* conceived the same idea.

Cloth hoods are sufficient but we were continually searching and testing other impermeable textures which would not only retain gas but which would also be more durable. We also attempted to make sleeves with sacks which would enable us to treat a leg or other part of the body without being obliged to put the animal into the chamber and to treat other local maladies such as lymphangitis, local disease of the skin, necroses, etc.

Experiments Not Complete

In the numerous therapeutic applications no indisposition whatsoever has been noted on the animals or the men in charge who are more or less within the range of the vapor. With our first hood as well as with the one encircling the ears we have had a small number of cases of corneal infiltration caused by the irritation of the gas, but the effect is but a passing irritation without serious consequences and always disappears in a few minutes after leaving the chamber. With our new form of halter and by tightening the hood well these cases of benign irritation from escaping vapor will be few.

The aggregate of our disclosures should be considered incomplete (1) because they have not been followed with laboratory tests establishing the presence of insects and ova on the affected animals and their disappearance; (2) because the degree of the concentration of the gas was not determined.

In the observatians we made following our first report we stated that the search for insects and ova was interesting in making a differential diagnosis but that this would be of but little interest from the clinical point of view and that it was sufficient for us to prove that all skin diseases were amenable to treatment with sulphur gas. Laboratory men everywhere agree that it is not always possible to find insects and ova in horses indisputably mangy. In so far as it concerns the influence of the sulphur on the insects and ova such researches can have but a relative value because by putting the insects and ova in the solution of potash to make the microscopic examination, they are killed just the same as by the gas. Notwithstanding this we are continuing the laboratory researches not only to discover a better control but also to avoid criticism.

So far as the concentration of the gas is concerned and the means of making the observations we are in a position to make useful suggestions. We were mistaken when we said that the degree of concentration we obtained was 5 to 6 per cent of SO_2, and it was our report of this weak dosage that shook the confidence of some veterinarians in the value of our treatment. We were supplied with a sulphur meter but it had no value. The following calculations will establish the percentage (Researches of M. le Pr. Henry):

Molecular weight of $SO_2 = 64$ ($S = 52$, $O = 16$)

The capacity of the chamber according to the dimensions given is 26 cu. meters. In allowing a half cubic meter for each horse, the space remaining after the horses are in the chamber is 21 cu. meters. The weight of a cubic meter of air is 1 kil. 293, that of 21 cubic meters is 27 kil. 153, from which the percentage of the gas would be:

$$\frac{10 \text{ kil. } SO_2}{27 \text{ kil. } 153 \text{ Air}} = 35\% \text{ to } 40\%$$

We hope that the new calculations will enable us to put a new and reliable sulphur meter at the disposal of all. In waiting we advise the use of a small window in the wall of the chamber in which is placed a lighted candle. When the light goes out the concentration is sufficient.

One can not be too particular in com-

pleting the sulphuration by a perfect disinfection of the stable, tools, clothes of the men, etc., by the usual methods or if possible by the use of sulphur gas, and it must not be forgotten that the recurrences observed were not upon the part of the body subjected to the gas but upon the head and neck, particularly the jaws. It is therefore absolutely necessary to scrutinize these parts and to treat them as we have recommended.

In our preceding report to the *Société de Pathologie Comp.*, we stated that tests were being made in the treatment of mange with sulphur anhydrid in solution. It seems to have given good results, but its cost has prevented us from making many applications. It is therefore an economy to apply sulphur gas produced by the combustion of the sulphur, and it must be noted that sulphur anhydrid in solution produces a drop of the temperature of the chamber that may harm the animals and by contracting the vasomotors of the skin prevent the deep impregnations that are essential to the total destruction of the parasites. This, however, does not condemn the use of the solution, but for the moment puts it into second place, for this as well as for economical reasons: difficulty of obtaining it everywhere, transportation, etc.

Since April, 1917, the date of our first communication, owing to the fact that this new method involved a very considerable expenditure of money, a large and dependable personnel, with the collaboration of *médicin-major* Perdu and the help of the *Mission des Essais et Experiences,* we have (1) constructed a generating apparatus, L. V. C. P., practical, strong, complete, better than apparatus costing six times as much, easily made under all conditions and so simple that we would be refused a patent; (2) built a model sulphuration chamber of wood or brick that could be constructed cheaply; (3) offered the Minister of War a model of a mobile group-sulphuration chamber designed to treat animals in the small organizations and particularly at the front, and one demountable chamber of light wood, solid, which could be transported on a wagon or cart.

The use of this gas can be extended without limits. It is a valuable antiseptic and antiparasitic administered with a minimum of danger. Therefore we bespeak its general use for the following:

For the disinfection of grains and forages and for the destruction of various parasites. In a general way it might be stated that all germs, insects, molds, etc., are destroyed by the action of sulphur gas and should therefore be subjected to this treatment. Conservation would be assured and the deplorable results of

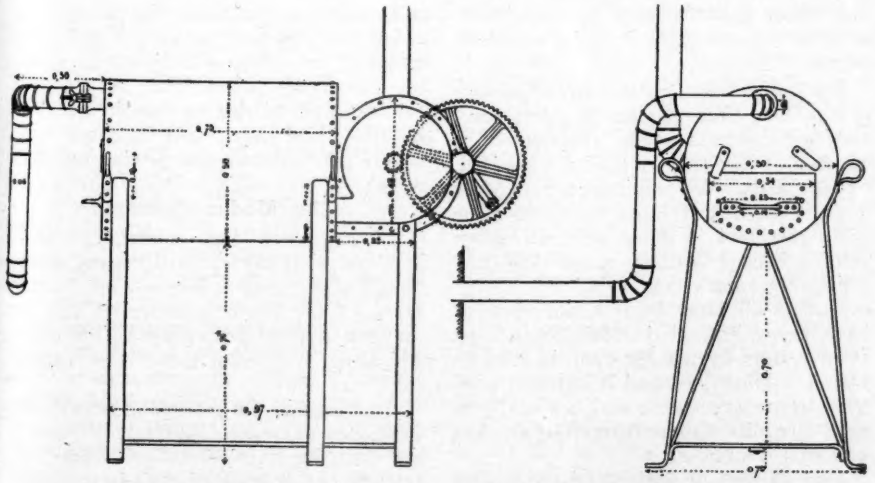

Fig. 4. Showing the mechanism of the apparatus for the sulphur gas treatment.

moldy or damaged feed to animals would be averted.

For the disinfection of stables, vehicles, tools, clothing and dwellings. It is useless to cure animals if they are allowed to become recontaminated by other animals or by brushes, combs halters, bridles, etc.

For the disinfection of slaughter-house waste, horse meat, etc., at their destination or before being used. The tests we have already made and which will ultimately be published is serving as the basis of experiments assigned to one of us. It aims at the most rational disposition of the slaughter-house waste and the carcasses of horses consigned to the butcher. We have shown that sulphur gas assures the preservation of these for several weeks. Our generator and sulphuration chamber could ultimately be used for this purpose. Meat submitted to sulphur gas is preserved and may be eaten without danger.

For the preservation of meats, vegetables, etc. With the same apparatus the preservation of fruits, vegetables, preserves, marmalades, etc., can be assured. It is only necessary to place the boxes containing these articles in the sulphuration chamber and submit them to the action of the gas. Manufacturers produce a paper treated with sulphur which they guarantee will preserve products enveloped in it for several days. This paper is easily made by submitting ordinary wrapping paper to the action of the gas.

For the treatment of diseases of plants. For a long time sulphur gas has been used with success in the treatment of a number of diseases of plants, especially of vineyards. We are free to state after a number of tests that this treatment costs less and is more effectual when sulphur is used by this process. We shall ultimately supply the technic.

During all times barrels and vintages have been sulphurated and chickens freed from vermin by placing them in a medium of sulphur gas, and it has also been used to preserve seeds which would otherwise require a more dangerous and less effectual treatment.

Our various activities and the urgent necessity of putting the method into operation in the treatment of mange in horses has prevented us from actively following, as we desired, the many tests delineated with SO_2. We can state, however, that the tentative treatment of the external forms of lymphangitis and of necrotic wounds promises great hopes.

We desire the collaboration of our confréres, whom we shall cheerfully supply with the means of application and shall give them due credit for the accounts they render. From our official experiments deductions were made as follows:

Recommendations for the sulphuration of groups of horses:

1. Clip the animals if possible.
2. Wash them carefully with soap and water.
3. When dry, a sulphuration of two hours.
4. On leaving the chamber treatment of the head as directed.
5. Three days later a second washing.
6. During the following days good grooming.

Note.—It is absolutely necessary that the grooming preceding the sulphuration be well done, especially on the parts more or less protected. Pellicles, scabs and exudates may shelter the insects and ova and thus prevent the penetration of the gas and lessen its efficacy. A sulphuration of two hours suffices to effect a destruction of parasites and their ova and consequently to cure the disease. It can also be depended upon with still more certainty when recontaminations occur by submitting the animals to another sulphuration of one or two hours during the third week and in every case before placing them among the well animals.

The Modus Operandi

1. Introduce the animals properly supplied with halters. Adjust the safety bars. Close the doors. Tighten the hood. Close the rear doors. Place the manger supplied with grain before them. (Feeding not recommended.—Translator.)

2. Place in the generator drawer the necessary amount of sulphur, 250 grams for each cubic meter of the room, deducting the volume of each horse—one-half cubic meter.

3. Set the sulphur afire and hermetically seal the drawer.

4. Turn the blower during the two hours at frequent intervals to maintain the concentration of gas in the chamber. Place a lighted candle in the diverticulum in the wall of the chamber and in contact with the gas; when the light goes out the desired concentration will be reached. It should then be maintained at that point.

5. Open the rear windows.

6. When the gas has disappeared remove the animals.

7. After each operation clean the chamber and the generator. The cracks in the chamber that allow gas to escape can be closed up with vaselinated cloth or putty.

After the treatment place the animals in a disinfected stall and tie them with disinfected halters.

Disinfect frequently all tools, blankets, clothing of men, etc., by placing them in the chamber and submitting them to the action of the gas.

Miscellaneous Uses

1. Destruction of all parasites of animals and vegetables.

2. Disinfection of clothing, the effects of men and dwellings.

3. Disinfection of grain and forage.

4. Disinfection of diversified merchandise (vegetables, meat, etc.).

The apparatus for sulphuration of horses in groups can be installed, fixed or mobile, without recourse to special manufacturers.

The small expense of construction is a great advantage.

Le vétérinaire aide-major Lépinay, *Mission d'Essais et d'Experiences, 23 bis rue de l' Universite,* Paris, will cheerfully supply plans and specifications free.

(Authorized translation. All the italics are ours.)

Efficacy of Some Anthelmintics

By MAURICE C. HALL and WINTHROP D. FOSTER, Washington, D. C., Zoological Division, Bureau of Animal Industry, Department of Agriculture.

(*Continued from page 244, May issue*)

Phenols

The phenols are a group of organic compounds composed of hydroxy derivatives of the benzene series, the hydroxyl radical being linked directly to the nucleus. The refined phenols include phenol (C_6H_5OH), commonly called carbonic acid; cresol ($C_6H_4CH_3OH$), commonly called cresylic acid or kresol; and the higher phenols. The term "crude phenols" is used in general to designate those unrefined mixtures of the phenols proper with certain hydrocarbon oils and other impurities with which they become associated in the course of their preparation, whether from coal-tar, wood-tar, or blast-furnace gases. There are on the market numbers of trade preparations in the form of soaps, powders, ointments, or liquids which contain refined or crude phenols as essential constituents, A number of these liquid phenol preparations have been used and recommended as anthelmintics. Some of these liquids are insoluble in water, in which case they may or may not be capable of being emulsified, and others are soluble in water.

Sheep. — Three preparations were tested, which may be referred to as A, B, and C. A and C are advertised as remedies for stomach worms, while B, though not advertised on the container for the treatment of stomach worms, has since been recommended by the New Zealand Department of Agriculture for that purpose. Two sheep were treated with A and one sheep each with B and C. One of the sheep treated with A passed four nodular worms. This sheep and the one treated with B died the day after treatment. The other sheep passed no worms.

Of the two sheep receiving A, the one which died had 422 stomach worms and numerous intestinal nematodes. The other sheep killed four days after drenching had no stomach worms postmortem

and few intestinal nematodes. As this sheep was evidently uninfested with stomach worms, it must be left out of consideration. The sheep treated with C passed no worms and had 8 stomach worms postmortem.

A second trial was made of A on two sheep, the dose given being the same as in the previous experiment—1 tablespoonful of the product (14.8 mils) to 1 pint (473 mils) of milk, as advertised on the label. The sheep passed no worms, and at postmortem examination were found lightly infested with stomach worms and intestinal nematodes.

Conclusion: While the experiment is inconclusive in regard to the efficacy of coal-tar phenols for stomach worms in sheep, since the experiment animals were so lightly infested, it failed completely as a remedy for lightly infested animals, and there seems to be no reason for considering that it would be more successful in heavily infested sheep. There can be little doubt that the treatment is dangerous. Two out of four sheep in the first experiment died, the postmortem showing lesions of pneumonia, pleurisy, and gastritis. In the second experiment both sheep collapsed after drenching, but seemed to recover. The pneumonic condition observed in the dead sheep may be attributed to getting some of the fluid in the lungs, an error in drenching, to be sure, but one almost impossible to avoid when giving as much as 473 mils of drench. In the writers' experience sheep will usually take quietly 118 to 177 mils of fluid by drench; but, after more is given, they begin to struggle, making the drenching increasingly difficult. Furthermore, the hemorrhagic lesions in the stomach of one of the dead sheep would seem to indicate the absorption of phenols through the gastric mucosa.

Dogs.—A further test of the anthelmintic efficacy of phenols was made, using another preparation, which is recommended as an anthelmintic for worms in dogs, the dose recommended being 5 to 8 drops (0.3 to 0.48 mil) in a tablespoonful (14.79) mils) of castor oil. The writers used 0.48-mil doses, administering this dose to each of two dogs, weighing, respectively 8.6 and 11.3 kgm.

Conclusion: The treatment was somewhat efficacious against ascarids in one case, but entirely inefficacious in the the other. It was effective against *A. Caninum* in both dogs. It also appears to be ineffective against Taenia, since it did not bring away the head, but this is a point that should have been confirmed postmortem.

We may conclude from the experiments on dogs and sheep, above recorded, that the phenols in the form of commercial disinfectants and dips are likely to be of little value and dangerous as anthelmintics.

Turpentine

Turpentine is a remedy very commonly advocated for use against nematode parasites, especially those in chickens, horses, and swine. The obvious objection to its use is its well-known injurious effect on the kidneys.

Poultry.—Since the treatment of chickens for worms is for obvious reasons so seldom undertaken by veterinarians and so commonly by owners of poultry who are not especially trained in medical lines, it is not surprising that the dose advocated for use in this connection is very variable. Some writers recommend a half teaspoonful of turpentine in an equal amount of olive oil; others recommend 1 to 3 teaspoonfuls of turpentine undiluted.

Six chickens, weighing between 4.45 and 0.9 kgm., were given 2 mils of turpentine mixed with 2 mils of olive oil, the birds being fasted from the previous day and the dose being followed at once with 8 mils of castor oil.

Conclusion: The remedy may have been more effective for tapeworms than the results indicate. Its principal advantage, however, seems to be as a remedy for roundworms.

Dogs.—Four dogs, weighing 2.5 to 7.7 kilos, were given preliminary purgation with castor oil, and dosed with turpentine at the rate of 1 mil per kilo of weight. The turpentine was given mixed with castor oil, 15 to 30 mils, according to the weight of the animals.

Conclusion: Turpentine in doses of 1 mil per kilo of weight is not very efficacious against ascarids in dogs, is entirely inefficacious against hookworms,

gives rise to pronounced suffering and temporary paralysis of the hindquarters, and may kill the dog.

Hogs.—Turpentine is frequently prescribed as a remedy for roundworms in swine. It is often given in repeated doses mixed with the feed. A better way is to make an emulsion of the turpentine with equal parts of flaxseed decoction. This is more easily miscible with the feed, and avoids the burning caused by the ingestion of pure turpentine.

An emulsion of turpentine and flaxseed decoction, made by boiling 85 gm. of flaxseed in 296 mils (10 ounces) of water, straining, and adding an equal amount of turpentine, was fed to three hogs by the junior writer. The hogs weighed from 45.36 to 68. 04 kgm. The equivalent of 7.4 mils of turpentine per hog or 44.36 mils of the mixture, was mixed daily in the feed of the three hogs for seven days. At the end of seven days all the hogs were listless, refused to eat, and were constantly voiding small amounts of urine, the nephritic symptoms continuing for a week after the treatment stopped.

Conclusion: The treatment was decidedly inefficacious and highly dangerous. The animals did not gain as rapidly as the other hogs kept under the same conditions but not dosed with turpentine. While separate dosing might have shown some efficacy for the treatment, the injury to the hogs precludes its recommendation as an anthelmintic.

Thymol

Dogs.—Prior to the war, thymol was the classic remedy for hookworm in man, and it was only after the war had made this drug practically unobtainable that serious efforts were made to find a substitute for it.

Thymol was administered at the rate of 130 mgm. per kilo of body weight, giving the thymol in capsules to 2 dogs and in drench to 2 dogs; in the latter case the thymol was dissolved in a small amount of alcohol and this added to water to make a fine suspension. After an interval of a half hour to an hour, calomel in doses of about 65 mgm. per 2.5 kilos of weight of dog was given. All dogs were fasted from the previous day.

Conclusion: Thymol showed a low degree of efficacy against hookworms, the parasite for which it is usually prescribed, and was more efficacious against whipworms and still more efficacious against ascarids. In the experience of the writers a number of drugs were found to be occasionally efficacious against whipworms, while at other times they were decidedly inefficacious. This variation may perhaps be explained as a matter of accident, depending on whether or not the drug succeeds in penetrating to the cecum in its passage through the alimentary tract.

The low efficacy and the danger in the use of thymol do not compare well with the comparatively high efficacy and safety in the use of chloroform, so far as the experiments with dogs are concerned. While the writers are impressed with the dangers in connection with the administration of most anthelmintics, and these dangers are quite impressive for chloroform as well as thymol, nevertheless, it seems that, with the exceptions already noted in the discussion of chloroform for cases where there is heart trouble, or lesions of the parenchymatous viscera, chloroform is not only much more effective than thymol, but, in therapeutic doses, is safer.

(*To be continued*)

PHARMACODYNAMICS

Pharmacology should begin in the laboratory, but it should end at the bedside. In our desire to know the effect of digitalis on the blood-pressure of a guinea-pig, let us not forget how to write a prescription. In our enthusiasm for pharmacodynamics, let us not neglect the art of administering a medicine. Yet, on the whole, the iconoclastic attitude of the modern pharmacologist is a salutary one. There is still much rubbish to be swept out of the Augean stables of the pharmacopeia. No drug should be recommended simply because it is venerable. Everywhere the modern tendency is to rank quality above quantity; we want fewer drugs, but more efficient ones.—*Med. Rev. Rev.*

Report on the British Army Veterinary Service

By MAJORS L. A. KLEIN and A. L. MASON, V. C. N. A.

AS DIRECTED by special orders from General Headquarters, American Expeditionary Force, January 23, 1918, we proceeded to France to study the organization, operation, administration and equipment of the veterinary service of the British Army. On our arrival January 29 we reported to the director of the veterinary service, who afforded us every opportunity possible for making our investigation. To him and to his officers we feel under the deepest obligation for the courtesies extended. We were conducted to four groups of veterinary hospitals on the line of communication, each group consisting of a reception hospital, a mange hospital and one or two general hospitals, three convalescent horse depots, one base veterinary supply depot, two advance veterinary supply depots, and five divisional areas in two different corps.

The British veterinary service is organized to detect communicable diseases as soon as they appear in a unit and to immediately institute measures to prevent their spread; to call attention to unsanitary conditions and unhygienic practices and to make recommendations regarding their correction; to relieve the mobile units of sick or inefficient animals, and to transfer such animals as promptly as possible to veterinary hospitals on the line of communication in order to reduce the period of treatment to the minimum and to afford opportunity for disposing of incurable or unserviceable animals while they are still in a condition to permit of such disposition. Prompt institution of treatment has the effect of not only diminishing the period of inefficiency, but it very often makes it possible to cure a condition which would not respond to treatment begun later. The salvage of incurable or unserviceable animals is of great economic importance. The receipts from sales of animals to farmers and butchers and of the products of rendering plants amounted to $3,500,000 in one year, much of which would have been lost if the animals had not been promptly evacuated from the units at the front.

Organization Simple

The organization of the British veterinary service is very simple. The veterinary officers and enlisted personnel are attached to divisional units to keep the animals under close observation for symptoms of communicable disease and for unsanitary and unhygienic conditions, to report animals for evacuation to hospital, to treat trivial conditions and to apply such treatment as may be immediately required for animals to be evacuated. A mobile veterinary section is attached to each division to evacuate animals from the units and transfer them to a veterinary hospital. Each division has a deputy assistant director of veterinary service, who is a major of the veterinary corps, to administer the veterinary service of the division.

An assistant director of veterinary service, who is a lieutenant colonel of the veterinary corps, administers the veterinary service of each corps, and a deputy director of veterinary service, who is a colonel of the veterinary corps, administers the veterinary service of each army.

Each veterinary hospital on the line of communication is commanded by a major of the veterinary corps, who has six to eight veterinary officers to assist him, the number depending on the size of the hospital. The veterinary supply depots are also in charge of veterinary officers or of non-commissioned officers of the veterinary corps. The line of communication is divided into two areas and the veterinary formations in each area are under the supervision of a colonel of the veterinary corps. The entire organization is in charge of an officer of the veterinary corps who formerly had the rank of brigadier general, but who was recently promoted to be a major general.

Function of Veterinary Officer

The principal function of the veterinary officer attached to a unit is to look out for communicable diseases and conditions which may affect the health or efficiency of the animals, and to see that animals requiring hospital treatment or those which are unserviceable are promptly evacuated. He also treats minor ailments and injuries and applies any treatment which may be immediately required for animals to be evacuated. Animals to be evacuated are conducted to the mobile veterinary section by a non-commissioned officer or enlisted man of the veterinary corps, but when many are to be evacuated the commanding officer of the unit details as many men to assist as seems necessary. The veterinary officer makes out a statement which is sent with the animal giving the designation of the unit, the age, color, markings and sex of the animal, and the reason for evacuation. A linen tag bearing the same information is also attached to the halter: a red tag for mange or other communicable disease, a blue tag for surgical cases, and a white tag for medical cases.

The mobile veterinary section is situated back of the wagon line, near a wood and a watering place, within one to three miles of the rail head. Its location is indicated by the flag of the veterinary corps. When a division takes a new position during active operations similar flags are put up along the roads leading from the front to the mobile section to direct men bringing horses back.

When an animal arrives at the mobile section a receipt is issued for it and the information on the accompanying statement is entered in a book and the case is numbered. This number and the number of the mobile section is stenciled with white paint on a clipped area on the left croup. The animal is then examined, any treatment required is applied, and it is then stabled.

The officer commanding the mobile veterinary section communicates with the railway transportation officer at the railhead regarding the number of animals to be transferred to hospitals and is notified when to send them to the railhead. When there is not much activity at the front, the mobile veterinary sections in a given area send their cases on certain specified days to a particular reception hospital. This plan was adopted so that the railroads could make up special trains, as they object to taking a car or two of animals on their regular trains. The special trains make the run to the hospitals in such good time that they are now used whenever possible. When a big rush is on, the mobile sections report to the assistant director of a veterinary service (corps veterinarian), through the division veterinarian, the number of animals to be transferred to the hospital and he arranges with the railway transportation officer for the necessary trains. The destination of the animals at such times depends upon the state of the hospitals, and information on this point is furnished to the division superintendent through the deputy director of veterinary service by the director of the veterinary service.

History Carefully Taken

When animals are transferred to a hospital, the officer commanding the mobile veterinary section prepares a statement designating the unit from which each animal came, the reasons for evacuation, and the number given to the case by the mobile section. Until a short time ago, the age, color, markings, and sex of each animal were also given, but at present an experiment is being made to see if this data cannot be omitted and thus save clerical labor. This statement is made in triplicate, one copy is retained, one is forwarded to the corps veterinarian through the division veterinarian, and the other is forwarded with the animals. Mange cases are shipped in special cars, plainly marked.

Up to the present time, it has been the practice to send one man with each car of horses, with a non-commissioned officer in charge of the party, but it is now planned to send one man with each two cars, as this number is believed to be sufficient. Each man is provided with a bucket to water the animals and rations sufficient for the journey are also included.

When the train arrives at the railroad station near the reception hospital, it is

met by a veterinary officer from the hospital to whom the non-commissioned officer from each mobile section delivers his descriptive statement. The animals are then taken out of the cars and examined, those showing symptoms of mange, catarrhal disease, periodic ophthalmia, ulcerative cellulitis, or other communicable disease, being placed in separate groups. The mange cases are sent directly to the mange hospital and the others are taken to the reception hospital.

On arrival at the reception hospital, the animals are checked off on the descriptive sheets and each animal is given a hospital number, which is entered on the sheet. The number is stamped on a strip of biscuit tin, 1 by 3 inches, together with the date, and the strip is then wrapped around the left cheek strap of the halter. Another tag stamped with the number of the mobile section and the date is fastened to the hair of the tail. A receipt for the animals is returned by the non-commissioned officer to the officer commanding the mobile section. Each case is entered in the hospital book; a hospital card is made out for each animal and accompanies it wherever it goes until the case is terminated.

Mallein Test Applied to All

The several groups of animals are then stabled separately and the palpebral mallein test applied, the animals from each mobile section being kept separate until the test is completed. If an animal reacts and shows open lesions of glanders, it is traced by means of the tags, the hospital records, descriptive statement, etc., to the unit from which it was evacuated, and the division veterinarian is directed to have the other animals of the unit tested for glanders. Cases of other varieties of communicable disease are reported back in the same manner, so that the necessary action can be taken to prevent the spread of infection. In any event, all animals are given a second mallein test two weeks after their arrival at the hospital in order to detect any case of glanders which may have been in the incubation stage when the first test was made.

When the mallein test is completed the animals are classified according to their condition and stabled accordingly in the reception hospital or are transferred to a general hospital, depending upon the state of the hospitals. The animals taken to the mange hospital are handled in a similar manner. When animals have recovered they are sent to a remount depot if ready for service; if not, they are sent to a convalescent horse depot to recuperate.

A close check is kept on the time animals remain in hospitals and convalescent horse depots. As a general rule it is not economical to keep an animal under treatment more than three months, including the time in the hospital and the convalescent horse depot. The officers in charge of subdivisions of veterinary hospitals and convalescent horse depots are required to report each week to the commanding officer the number of months the animals in their charge have been under treatment, and the commanding officer then inspects those which have been under treatment over three months, and decides which shall remain under treatment and which shall be sold. Whenever it appears at the time of the arrival of an animal at a hospital that its treatment will not be profitable it is disposed of at once.

The cars which carry the animals to the hospitals from the mobile sections are cleaned and disinfected before they leave the station at which they are unloaded. It is the rule to disinfect all hospital stables every two weeks. Disinfection is usually carried out by painting the wood surfaces, excepting the floors, with tar, and then flaming this and all metallic surfaces with a blow lamp, after which all surfaces, including the floors, are washed down with cresol solution. The blankets and other equipment of animals affected with mange are also disinfected, the former by steam and the harness with chloride of lime. Grooming kits are disinfected by soaking in soda solution and then immersing in cresol solution, the brushes being subsequently soaked in salt solution to stiffen the bristles.

At all of the veterinary hospitals and convalescent horse depots the oats fed to the animals are either crushed or steamed and are mixed with bran and

cut hay. It is considered beneficial to mix the grain with cut hay for horses with weak digestive powers; crushing or steaming the oats increases their digestibility.

Casualty Clearing Stations Organized

Casualty clearing stations are now being organized to relieve the mobile sections and to reduce the possibility of their being congested with cases during a big rush. There will be one for each corps and their stations will be determined by the division veterinarian.

The casualty clearing station will receive animals from the mobile veterinary stations operating in the vicinity and care for them until they can be placed on railroad cars to be transferred to a reception hospital. The first mallein test will be applied at the casualty clearing station, thus providing for the earlier detection of animals affected with glanders and consequently reducing the danger of spreading the infection. Facilities will also be provided for performing surgical operations, so that the treatment of many of the animals requiring surgical interference can be begun earlier than under the present arrangements, thus reducing the time of hospital residence.

At some of the stations, if not all of them, a dipping vat will be constructed for the immersion of animals which have been exposed to infection with mange. There will also be facilities for disinfecting blankets and horse equipment. One such plant is under construction and nearly completed. Animals affected with mange will be evacuated to mange hospitals on the line of communication and dipped there, as heretofore.

The dipping vats and disinfection facilities at the casualty clearing stations are being introduced as an additional means of controlling the disease by dipping animals which have been exposed to infection and thus subjecting to treatment animals which may be infected but which do not as yet show signs of the disease. The treatment of animals affected with mange by hand applications in the units to which they belong is strongly discouraged, and anyone persisting in this method is sharply rebuked. It has been found by experience that hand applications for the cure of mange may frequently produce considerable irritation of the skin, with swelling and cracking. This occurs usually when the mixtures applied contain a drying oil, but it has also occurred when a bland fat like lard was used. Another serious objection to this method of treatment is that diseased areas are likely to be overlooked for a time, the period of treatment thus being extended and the cure of the animal sometimes being made impracticable. Experience has proved that the best method of treating the disease is by immersing the infected animals in a bath containing calcium sulphide.

Near each group of hospitals on the line of communication a rendering plant will be installed to dispose of carcasses of animals which die or are destroyed in the hospitals. During a big rush the disposition of dead animals presents an almost insurmountable difficulty. Local knackers are not to be depended on and burial is slow and requires large numbers of men. For several months a small rendering plant has been in operation near the group of hospitals, and it has proved so profitable that it has been decided to erect similar plants near the other hospital groups. This plant is unique in that it is operated by gas obtained from a chalk pit in which animals and manure were deposited last year, the gas being generated by the decomposition of the carcasses and manure. An experiment to determine if gas could be obtained from manure dumps for fuel purposes demonstrated that the inflammable gases were not produced in sufficient quantity in manure alone to be of practical value.

Accurate Reports Required of all Units

The veterinary officers attached to divisional units prepare a report every Thursday of the number of animals evacuated during the week preceding, the number treated in the unit, the conditions affecting them, the number of animals on duty, the sanitary condition of the horse lines, etc., and on Friday morning they meet the division veterinarians in conference, when the report is presented and questions pertaining to the veterinary service of the division

and to the health and efficiency of the animals are discussed. If an officer cannot attend the conference he sends his report by special orderly. These reports and the report from the mobile veterinary section of the division are consolidated by the division veterinarian, who presents his report to the corps veterinarian on Saturday morning at a conference at which the veterinary affairs of the corps are discussed. The division veterinarians meet the army veterinarians in conference on Sunday morning and present their own reports and those from the divisions in their corps. All of the reports are then forwarded by the army veterinarian to the director of the veterinary service. This system insures prompt delivery of reports, makes it unnecessary to send them back for correction, and provides an opportunity for the discussion of difficult problems and for an interchange of views regarding various phases of the work. When the reports are received in the office of the director of the veterinary service the information is tabulated, and from these tables one is able to see almost at a glance the conditions existing in any division, corps or army.

Requisitions for veterinary supplies made by veterinary officers attached to units are presented to the division veterinarian, and after approval or modification are forwarded by him to an advance veterinary supply depot, from which the articles called for are issued to the officer direct. The advance depots receive their supplies from base veterinary supply depots, which in turn receive their supplies from the principal veterinary depot in England. The advance depots supply the field units, the base depots supply the advance depots and the veterinary hospitals on the line of communication.

The veterinary hospitals on the line of communications are of three kinds: reception, general and mange hospitals, but the administration is the same in all cases. Each hospital is in command of a major of the veterinary corps, with a staff consisting of six to eight officers, depending upon the capacity of the hospital. The organization is divided into a headquarters and five to eight subdivisions, each subdivision having charge of two hundred and fifty animals. Each subdivision is entirely self-sustaining, but the headquarters personnel is distributed among the different subdivisions for quarters and messing. The headquarters personnel consists of a commanding officer, a quartermaster, who also acts as adjutant, a sergeant-major, and the necessary men for the orderly room, quartermaster's store, pharmacy, laboratory, operating room, saddlers' shop, hauling and preparing forage, and police. The personnel of each subdivision consists of the veterinary officer in charge, the men necessary for feeding, grooming, stable police, dressing, etc., and cooks. The veterinary officers in command of subdivisions are responsible to the commanding officer for the care and treatment of the animals in the subdivision and for the personnel.

Daily and Weekly Reports

At the end of each day a report is prepared by the officer in charge of the subdivision and turned in to the orderly room, giving the number of animals rereived for treatment, conditions affecting them, the number evacuated, number died or destroyed, and the number remaining under treatment; also the number of men on duty, number sick, etc. These reports are consolidated in the orderly room and an abstract showing the state of the hospital is telephoned each evening to the deputy director of veterinary service in charge of the line of communication area in which the hospital is located. On the basis of this information the deputy director of veterinary service directs the transfer of animals from the front on the succeeding day.

A weekly report is prepared from the daily reports and forwarded through the deputy director of veterinary service to the director of veterinary service, in whose office the information contained therein is tabulated for convenient study and reference. A weekly report of the period of residence of animals in the hospital is also sent through the same channel. Similar reports are made by the officers commanding convalescent horse depots.

Each veterinary officer in the field is

provided with a veterinary officer's wallet, which contains the medicines, instruments and materials necessary for emergency treatment, and a veterinary officer's field chest containing the instruments, medicines, etc., required for general treatment. A farrier's wallet is furnished to each sergeant of the veterinary corps on duty with troops and to each non-commissioned officer in a mobile veterinary section, while a unit veterinary chest, containing the supplies necessary for first-aid treatment, is supplied to all organizations having a representative of the veterinary corps attached.

In addition to the above, each mobile veterinary section is provided with picket lines, stable equipment, one wagon, one ambulance, four draft horses, and fifteen riding horses. This is sufficient to provide mounts for all but six of the men, and this number are usually engaged in conducting horses to a hospital. When a mobile section remains stationary for any time shelters for the personnel and horses are erected from any material at hand and great ingenuity has been shown in this respect.

At the veterinary hospitals on the line of communication tents were used at first as shelters for the animals, but these have been almost entirely replaced by buildings of iron and wood. Beech plank, beech and pine blocks, stone and cement are used for floors. A noticeable feature of hospital construction is the extensive use made of the wire from baled hay, hay racks, fences, hay baskets, holders for grooming kits, and many other useful contrivances having been made from this material.

All of the hospitals are very neatly kept. No manure is allowed to collect and the vacant spaces are sown to grass or planted with flowers. They are all supplied with a simple but complete veterinary equipment.

The horses in the first wagon line of the divisional areas which we visited had shelters and standings similar to those provided for the veterinary hospitals, and the animals were all in excellent condition. They were well shod, apparently well fed and thoroughly groomed, and in their appearance would compare favorably with the horses in well conducted city stables in peace times.

Remarkable Results Shown

The excellence of the veterinary service of the British Army is attested by the results. Of the animals treated in the hospitals from August 18, 1914, to December 27, 1917, only 3 per cent died; 77 per cent were cured and 20 per cent were sold to farmers and butchers or destroyed on account of incurable conditions. These results would be considered very creditable if obtained under peace conditions; under war conditions they are remarkable.

The incidence of disease has also been held down to a very low point, compared with other wars and other armies. During the week ending January 24 the animals in the hospitals and those in convalescent depots represented 10.6 per cent of the animals in the British Expeditionary Force. But this percentage is in excess of the actual proportion of animals requiring treatment in hospitals or convalscent horse depots, as it includes animals ready to be transferred to remount depots but which the latter cannot receive for lack of room. At times the percentage of animals in hospitals and convalescent horse depots has been as low as seven.

Glanders, which has always prevailed to an extensive degree in every large army previously mobilized, is under complete control and practically does not exist. During the week ending January 24 not a single case was reported.

Mange, another disease which always appears and, unless preventive measures are instituted, spreads rapidly in armies, is not only being held in check, but is being repressed. At the present time there are fewer cases than at any time since March, 1916, when the greatest number of cases occurred, and it is expected that the methods now in operation will further reduce the prevalence of this disease. A difficulty in the control of this disease is that private stables in the zone of the armies are very generally infected with mange mites.

In the beginning of the war all but a very small percentage of the mange cases were of the psoroptic variety, but

now this variety is quite rare and most of the cases are of the sarcoptic type. A considerable proportion of the animals reported as affected with mange are found to be infested with forage scarini.

The disease which is of most concern at the present time is periodic ophthalmia. This disease appeared only a few months ago and its source is unknown. The institution of preventive measures is a difficult problem, because neither the cause nor the method of transmission is known. During the week ending January 24 the incidence of this disease was 421 to 100,000.

Epizootic lymphangitis is another serious disease which has required attention. The first case did not appear until last October, and since then, although a sharp lookout has been maintained, only a comparatively small number of cases have been discovered and these have been promptly destroyed and the exposed animals placed under observation. On account of the insidious character of the disease, its contagiousness, and its tendency to progress until the animal is rendered useless or dies, its appearance is a matter of grave concern and considerable attention is being devoted to its control and repression.

Ulcerative cellulitis has decreased, the incidence for the week ending January 24 being 43 to 100,000. For the same week the incidence of necrotic dermatitis was 12 to 100,000; quittor, 12 to 100,000, these conditions being prevented to a large extent by the dry standings provided for the animals at the front. Wounds from gun fire are surprisingly few, only 14 to 100,000 being reported for the week ending January 24. The other diseases and conditions reported are such as are usually met with in an ordinary general veterinary practice.

The British Army is to be congratulated on the efficiency of its veterinary corps, and the officers of that corps have every reason to be proud of the service they have rendered.

Tuberculin Test

By E. W. LITTLE, D. V. M., Topeka, Kan.,
Deputy Live Stock Commissioner

RECENT investigations by the medical profession in New York City and other large municipalities have revealed that the bovine tubercle bacillus is the primary cause of human tuberculosis to an alarming degree. This fact brings it closer home, so to speak, to the dairyman and the veterinarian, in that the responsibility rests with them in fighting this most destructive disease of both man and beast.

The old saying that "practice makes perfect" is applicable to all professions to a certain degree, but the point of perfection has never been reached in any one instance in the diagnosis of any one disease. We are, therefore, forced to do our utmost in perfecting the knowledge and procedure at hand to the highest point of efficiency possible.

The tuberculin test as applied by both government and laity, is lacking in many of its phases and in efficiency and uniformity of results. Having been in constant touch, in the capacity of veterinary inspector and in private practice for the last eight years, with the application of the tuberculin test in its various forms, I am still convinced there are many pitfalls which the general practioner will come in contact with and will overlook with a clear conscience.

Let me say in the beginning that the combinaiton of theory and common sense is sometimes of the utmost importance, and I believe that in the application of the tuberculin test, the first should be regarded as important as the latter. In the first place, what are the conditions favorable to a satisfactory thermal (subcutaneous) tuberculin test? The proper place for the administration of the tuberculin test is at home under the most normal conditions obtainable. The animals should not be unnaturally confined, such as being placed in stanchions, unless they are accustomed to same. An excitable nervous animal should not be given the thermal test.

On the day of starting the test the

first temperatures should be taken about 10 a. m., followed by temperatures at 1 p. m., 4 p. m., and 7 p. m., and the injection should be made either at 8 or 10 p. m., to suit the convenience of the operator. Post-injection temperatures should be taken eight hours after injection and continued every two hours until the twentieth hour, viz., 4, 6, 8, 10, 12, 2 and 4 p. m. I would much prefer to inject at 10 p. m., and take the first temperature at 4 a. m., as there are too many early reactors which go by unnoticed, especially in cattle tested on the public markets where no history is available. Then, by continuing the temperatures until 4 p. m. or later, one is also able to detect the late reactors. The same is true in retesting herds which have been classed as suspicious, wherein the possibility of late reactions are more certain to occur.

Pitfalls in Tuberculin Test

It may seem that the foregoing procedure verges on the technical, but from the standpoint of the sanitarian and those versed in postmortems, it will be very evident that the care and time taken were well worth while in dealing with a disease so common, dangerous and destructive to both man and beast.

The pitfalls of the tuberculin tests as applied by so many veterinarians are best illustrated by the examination of test charts in the files of the State and Government offices. During my incumbency as a veterinary inspector in the B. A. I., and State of Kansas, I had opportunity to examine thousands of test-charts issued by veterinarians in every state in the Union. It is astonishing to note the numerous variations in tests which can be classified as follows:

1. The perfect test-chart and the correct test it represents.
2. The perfect test-chart and the false test it represents.
3. The test-chart and test on cattle under ideal conditions where the veterinarian was ignorant but honest.
4. The unscrupulous veterinarian and the unscrupulous owner.

1. The perfect test-chart and the correct test it represents. This test-chart shows temperatures taken at the proper time and carried to proper completion. The chart indicates the number of reactors, if any, the classification of the tested herd as exposed in case of reactors taken from the same for the information of the state authorities at destination. A detailed description of each animal and a permanent identification made.

2. The perfect test-chart and the false test it represents. In this we deal with the veterinarian who has gone through the motions of the test and has made improper temperature readings or has completed the test in his office with manufactured temperatures. Such has been very evident from the number of charts examined, and a miserable job of deceitfulness has been perpetrated. If one experienced would stop to think that in a proper test not more than one out of fifty animals will go through a test with a variation of not more than two-tenths of a degree, while it has come to my notice that test-charts on carload after carload have shown no wider variation than stated.

3. The test-chart and test on cattle under ideal conditions where the veterinarian was honest but ignorant. In this class I have examined charts where it was very evident that the veterinarian making the test did not know when he had a reactor or when one should have been classed as suspicious, as evidenced by the temperatures recorded. This may be due to faulty education and instruction or to lack of experience in this line of work.

4. The unscrupulous veterinarian and the unscrupulous owner. The unscrupulous veterinarian will lose the confidence of his clients in the long run, and do a greater injury to himself. He has nothing to gain and everything to lose and is a detriment to the public health. The unscrupulous owner or dealer in cattle is a man who will meet the same fate as the veterinarian, and will injure himself as well as the community in which he lives. Both classes should be barred from all operations of their selected business through punishment of some kind to impress on their minds their obligations to the health and happiness of their neighbors.

The following axioms may be of ut-

most importance to all in the application of the thermal test:

1. Give the animal a fair show in the beginning of the test, viz., normal surroundings and comfortable quarters.

2. Preliminary temperatures should be taken at intervals so as to be of use in determining a true reaction on the day following.

3. Do not inject an animal with a temperature of 103° or over at the time of injection.

4. Do not inject an animal that has shown a temperature of 103.5° or higher on any one preliminary temperature.

5. Graduate your doses in accordance with age and size. Never give under 2 cc. to the smallest or over 6 cc. to the largest.

6. *Reactor.* A rise of 2 degrees or more above the maximum temperature observed on the previous day, or one which goes above 103.8° F., should be regarded as an indication of tuberculosis, provided the temperature reaction shows the characteristic rainbow curve.

7. *Suspicious.* Animals which, after injection, show a rise of temperature of 2° with a maximum between 103° and 103.8° F., as well as those which show a rise of less than 2° F., with a maximum temperature of 103.8° F., or more, are to be regarded as suspicious. These suspicious cases should be held for a retest ten weeks later, giving double the original dose.

It is the opinion of the writer after years of constant observation that the public markets and stockyards are not proper places for making a satisfactory thermal test and such should not be applied there. In my experience I have consumed a week at a time testing a carload of cows on a public market, due to the abnormal temperatures which ninety per cent of the cases showed, owing to unfamiliar surroundings and excitement from shipping and handling.

In testing dairy cows on the farm where dairying is the business engaged in, I have found it almost impossible to start some cows in the test due to high temperatures caused by intensive feeding for milk production, the cows being perfect pictures of health, but could not be given a fair test in justice to the cow and the owner.

Do not retest a positive reactor with the view that she might not react a second time.

Do not retest for any reason within 60 days after the previous test.

Do not advise the Bang system of isolation and quarantine of reactors, for if carried out properly it is expensive and a losing proposition in the end, and a detriment to the public health, only in cases hereinafter stated.

Intradermal Tuberculin Test

First of all your client is not so well versed in the application of any one test, but there is that instinct in every person to want to be shown, and when he sees something comprehensive it has a lasting and more satisfactory effect and such is the result after giving the owner a brief outline of the intradermal test. He will better understand the cause and effect. It can be said that the intradermal is an all-weather and all-condition test, and hence there are very few annoying influences in the way of a conclusive diagnosis.

The intradermal tuberculin test consists of the injection of three to five drops of tuberculin (B. A. I.) into the deep dermal tissue of the caudal fold, about three inches posterior to the anus. The injection of the tuberculin is made with a 24-gauge, ⅛-inch dental needle. After your animal is properly confined, grasp the whole tail in one hand and then with the caudal fold pushed out into view make your injection with a slanting position of the needle. Proceeding in this manner it will be almost impossible to make anything but a true intradermal injection. It may be stated further that the application of antiseptics at the point of injection is not desirable, as too many times the antiseptic applied is the cause of a reaction which is liable to be confusing in determining a true intradermal reaction. We should further bear in mind that the bovine species is less subject to infections of this kind than any other species. It can be safely claimed that intradermal reactions due to infection are greatly in the minority, and a safe estimate would be less than one per

(*Continued on page* 301)

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Private Schools May Be Discontinued

THE Surgeon General of the army has issued a statement that after June 30, 1918, no veterinary graduates will be eligible for commissions in the army unless from a college which maintains a minimum entrance requirement of at least two years' work in an accredited high school, or its equivalent in academic training, to be demonstrated by an examination, and that after June 30, 1919, this minimum entrance requirement will be raised to four years' high school work. It is also stated in the letter accompanying the order, that this action has been taken after a conference with the Bureau of Animal Industry, and that the Bureau will probably adopt the same regulation.

As that is practically the advertised standard of the private veterinary college at this time, it might be thought that the ruling was not one of importance; but quite the contrary is the case, for the Surgeon General provides that this examination, demonstrating the equivalent in academic training, shall be held by the committee on matriculation at the university of the state in which the training has been received, or by the State Board of Education of the state in which the schooling was had, this provision being a substitution for the present method of giving examinations at the veterinary colleges in which the application for admission is made, by the faculty of the school.

One will not start an argument by saying that this privilege of entrance by examinations in lieu of high school credits has been abused in the past. Of course the abuse has been by some other school than the one to whose representatives one is speaking; but nevertheless, all will admit that the examination privilege has been abused, and it is out of this abuse that the Surgeon General's order has grown.

The private veterinary colleges have a committee in Washington at this writing, endeavoring to get the Surgeon General to modify this ruling regarding examinations. They wish to compromise on a provision that any high school principal may give the examination, and thus save the applicant the time and expense of a trip to his state university or his state capitol, and permit him to take an examination in his home town or some nearby place, when presumably he will be in better condition to stand such a test, and more likely to do himself justice. There is good argument in this claim, but when those asking for this concession so freely admit abuse of a greater concession offered in the past, the argument loses not a little of its force, and there is grave doubt as to whether the Surgeon General will recede in any particular from the order he has issued. If he does not recede, it takes no prophet to say that no more classes will be graduated from accred-

ited private veterinary schools. Five of the private schools—but we hardly think more—may open in September. Some of them may complete the year—one almost certainly will—but there will be no classes to graduate from the private schools next year, (except hold over students from last year's class) and that any of the private schools can maintain themselves on the accredited list for two years and graduate a class, even though they pool their interests, and only one attempts it, seems doubtful. The question simmers down to this: Is it best for the Surgeon General to adhere to his ruling, and compel us to depend henceforth on the state veterinary schools for veterinarians for the army, for general practice and for bureau work? Or should he recede from his demand and make such concessions as will enable the private veterinary schools to bridge over the gap between the time when the state schools are unable, as they are now, to graduate a number of veterinarians equal to the yearly requirements of the country, and the time, not far distant, when they will be fully able to do this?

But for the war and its heavy drain upon the profession there would be little question about the matter. The private veterinary schools have performed a most useful function. The remarkable development of the live stock industry of this country has depended in no small degree upon them; but, excepting for the war, the country had arrived at a point where it could dispense with their services without serious inconvenience. At the outbreak of the war the number of veterinarians in the country was more than sufficient for all purposes, and a dearth of graduates for a few years, while the present state schools were increasing their classes and new schools were being established, would not have been serious. But, whether with the thousand veterinarians already in the army, and the possibility of as many more being called, the country can, without serious loss, get along for three or four or five years with but small additions to the veterinary personnel, is a question that might well raise serious doubts in the minds of those responsible for the change. The private schools believe that if the entrance examinations can be brought to the student and made convenient for him to take that a goodly number of desirable students will be attracted to and that they can continue to graduate veterinarians as heretofore and possibly be the means of preventing a very serious shortage in the number of veterinarians needed in the near future.

It is placing a heavy responsibility on the existing state veterinary schools, and an obligation on a number of agricultural colleges that do not maintain a course of instruction for veterinarians to institute such a course. We believe that the state schools will measure up to these increased responsibilities; that they will increase their faculties; pay salaries that will attract to these faculties veterinarians of the best type; that they will improve their clinical instruction; and that they will turn out men not only well grounded in the theory and science of veterinary medicine, as they have heretofore done, but better equipped in practical knowledge and in information necessary for successful practitioners. If they are not called upon to provide all veterinary instruction during the coming year they will the following year or soon thereafter and it is none too soon to begin to prepare for these added responsibilities, to show the Surgeon General, the Bureau of Animal Industry, and the American Veterinary Medical Association that they were justified in bringing about desirable changes that have transpired in veterinary education in the past five years.

A TAX ON MEDICINE DISPENSED BY VETERINARIANS

Sections 600 and 601 of Act of October 3, 1917, "The War Tax on Commodities," imposes a tax of two per cent on all pills, tablets, powders and other medicines sold by veterinarians in containers other than those in which they receive them; that is, on all colic remedies, fever mixtures, blistering ointments, etc., which the veterinarian compounds or puts up himself and sells; also on all medicines that he dispenses at his office or that he leaves with his

patient when making a call, provided a charge (in addition to the charge for the call) is made for it. The tax is two per cent of the retail price of the drugs sold, and is to be reported and paid monthly to the commissioner of internal revenue for the district in which the veterinarian resides. The report must be made on application blanks supplied by the commissioner of internal revenue.

The law is in force now; the penalties for failure to comply with it are heavy. Write for the blanks and send in your report monthly.

Army Veterinary Corps Miscellany

Assignments to the veterinary corps have been numerous during the past month but new commissions in the corps have been few. That is, many enlisted men have been assigned to the veterinary corps from other branches of the service but only a few veterinarians have been given commissions as veterinary officers in the corps since the announcements in these pages last month. The latter include Dr. Robert Graham of the department of animal pathology of the University of Illinois, commissioned second lieutenant and assigned to the laboratory which has been established at Philadelphia and placed in charge of Major S. H. Gilliland.

January 8, 1918. The bunch that performed the first major operation in the first veterinary hospital established by the American army in France. Left to right: Lts. Wright, Cline and Hampton; Capt. Williams; Lt. Savage. These veterinary officers are of Major Merillat's command.

One unfortunate development during the month was the delay in calling to the colors those of the graduating classes of the private veterinary colleges who had enlisted in the medical reserve corps. This includes about three-fourths of all those who were graduated on April 23. It had been announced by the Surgeon General's office that they would be called to active service immediately after graduation and when they reported at their various cantonments that they would be assigned to the veterinary corps as a part of the enlisted personnel and given examinations for commissions which would be issued to those making a satisfactory showing when the government could use their services as officers. It is assumed that some of the many alterations in the plans of the War Department growing out of the tremendous drive on the Western Front have unavoidably delayed calling these men. In the meantime they are adrift as to their own plans; many have accepted temporary appointments in the Bureau of Animal Industry.

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The most interesting development, during the past month, affecting the veterinary corps "over here" was the establishment of the veterinary training school at Camp Lee, Virginia. Major G. E. Griffin, for more than twenty years a veterinarian in the regular army, is senior instructor in this new school. The other veterinary instructors are Major E. B. Ackerman, Drs. C. M. Haring, J. V. Lacroix, W. E. Muldoon, F. H. Mackie, J. R. Stifler and J. W. Claris.

Mess shack of Major Merillat's veterinary corps "somewhere in France."

The veterinary training school at Camp Lee when completed will comprise fifty-two buildings, including a large base hospital. It is unlike any thing else in this country and considerably larger than any similar institution in other countries. A corps of line officers, veterinary student officers (including 24 from Camp Greenleaf whose pictures were shown in our May issue), and enlisted men of the veterinary corps are being trained there now for overseas service. The entire enlisted personnel of the veterinary corps not already in France will be trained here before being sent overseas. It has been announced that the enlisted personnel of the veterinary corps in the United States comprises nearly 2,000 now and 1,600 more have been called in the draft to report during the twenty-five days following May 25th.

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The news of the veterinary corps over-seas is of more than usual interest. Mention was made last month of Major L. A. Merillat and his splendidly equipped hospital on the advance line of communication and his hope that he might stay there two months more in order to earn the "danger zone chevron," awarded for six months' continuous service in the danger zone. In this he has perhaps been disappointed, for he has been relieved by another Chicago veterinarian, Major George B. McKillip.

Major McKillip organized a complete veterinary unit at Camp Upton, consisting of seven veterinary officers and an enlisted personnel of 300. It must have been a great surprise to Major Merillat and his officers to see this complete veterinary unit come marching in to relieve them. It is what the veterinary corps have fought for in this country and even more in France—their own enlisted and trained men that cannot be taken away from them. After overcoming difficulties of every description Major Merillat had his unit fully organized and functioning so effectively that it had become a noted visiting place for the "high rankers," and he could turn it over to Major McKillip with no regret because of things left undone. And now that this important hospital is in the hands of a complete veterinary unit commanded by one of extraordinarily large experience and of the recognized ability of Major McKillip, veterinarians will have no fears for the reputation it will make for the veterinary corps on the American sector of the western front.

Major Merillat's new assignment has not been announced. By some it is expected that he will be sent to the Flanders or Picardy section, where the brunt of the present drive on the western front is being sustained, and where it is reported the wastage in horses since March 21, when the drive commenced, has been enormous. Others are speculating upon his being returned to Washington, where his experience at the front and his recognized ability as an executive and an organizer would be invaluable to the Surgeon General and to the veterinary corps.

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It has been decided by the Surgeon General of the army not to commission any further veterinarians from civil life. However, graduates of veterinary colleges this spring will be permitted to enter a training camp, probably at one of the remount stations, to see if they can qualify for commissions. There are already 450 commissioned veterinarians on the inactive list. How rapidly these may be transferred to the active list cannot be foretold, as the demand for them will develop with the progress of the campaigns in France.

The Surgeon General has also decided to induct into the service in the veterinary branch of the enlisted medical reserve corps veterinarians who are within the draft age, believing that they will be able to render their country more efficient service in that branch than in a line regiment.

It is possible, too, that a number of the veterinarians already commissioned may be demoted as not being found qualified for officers, and inducted into the service, where they are within the draft age, as enlisted members of the corps. This will prevent the injustice which has existed where veterinarians who have been called to the colors and

(Continued on page 308)

POINTED OPINIONS ON LIVE TOPICS by Readers of Veterinary Medicine

It is in reports like those of this department that the current history of the progress of veterinary science is written. Are you leaving a record of your experience which will help others, as you have been aided by these and other clinical reports? If not, you are earnestly invited to contribute from your experience that this department may be of the greatest service to its readers. By so doing you will earn the lasting gratitude of those who are aided by your suggestions.

Antepartum Paralysis in Sheep

In your May issue Dr. D. F. Luckey describes a condition in sheep to which he applies the name "pre-parturient eclampsia" and invites correspondence through the columns of the Journal.

It is well that Dr. Luckey has called the attention of the profession to this particular malady of sheep, for undoubtedly its occurrence is not generally appreciated, nor the prevention known for this distinctly preventable condition. Consequently the country has withstood the loss of too large a percentage of its very choicest ewes.

This condition was designated "antepartum paralysis" by Dr. J. F. Gilruth in Bulletin No. 15 of the Division of Veterinary Science in the New Zealand Department of Agriculture, Wellington, published in 1909. It was probably known to English veterinarians by this name for some time prior to the issue of that bulletin, inasmuch as the writer did not mention the condition or the name as being new and made no claim to a priority of naming.

The disease occurs to a large extent every spring in California, and presumably all over the world whenever ewes about to lamb are overnourished. Dry feed, as straw and chaff, are favorable to the disease. There can be no mistaking its identity. The general plethoric condition of the animal, head drawn back, occasional spasms at the onset, developing apparent blindness, and finally going down, unable to rise, and dying in the course of three or four days, with no undue rise of temperature, form a chain of symptoms not easily mistaken once they have been observed. The autopsy shows an abundance of fat in the abdominal cavity which may be somewhat watery, due to its rapid absorption during the illness of the animal. *There is always an intense, abnormally fatty liver,* therefore light yellow, somewhat enlarged, and friable. The kidneys and other organs may be somewhat fatty. Twin lambs are usually found in the uterus. However, both these and the uterus are normal. These organic changes, associated with the paralytic symptoms, distinguish the condition from a true eclampsia.[1]

Dr. Luckey has described the method of prevention which seems to have met with uniform success, namely, the administration of a laxative diet and exercise. This diet can be best supplied in the form of young succulent herbage when climatic conditions are favorable to the presence of such pasture. Driving on the road from one to four miles daily, preferably in the middle of the day, offers a simple and effective method of exercise. This treatment may be depended upon to quickly stop losses from antepartum paralysis.

In the same issue appeared a query concerning losses in sheep, answered by Dr. E. T. Baker, who offered the diagnosis of forage poisoning. From the brief description of symptoms and conditions under which the

[1]Hutyra and Marek, Vol. II, p. 774.

sheep were kept, it would seem not unlikely that these sheep also were affected with the malady just discussed.

The bulletin by Dr. Gilruth above mentioned is a concise and very fine treatise on the subject of antepartum paralysis, and should be read by every veterinarian who has occasion to handle diseases of sheep.

J. J. FREY,
State Veterinary Pathologist.
California.

PREPARTURIENT ECLAMPSIA OF EWES

In reference to the article in your May issue entitled "Good Care Kills Sheep?" will say that the disease described is well known in Wisconsin where cases have been observed nearly every winter for many years. We also have noted that this affection is confined to pregnant ewes. But, contrary to the experience of Dr. Luckey, we have observed it in half-fat as well as in fat ewes.

The cause appears to be the exclusive feeding of too dry food, like timothy hay, with no succulence, combined with insufficient exercise. This results in torpidity of the liver, constipation, impaction, and toxemia which is shown by nervous symptoms.

We believe that the term auto-intoxication better defines this affection than pre-parturient eclampsia, the name suggested by Dr. Luckey. However, pre-parturient eclampsia designates the time of appearance, and indicates that it affects the ewe only and is accompanied by convulsions.

When the following balanced ration, or similar one is fed to breeding ewes the disease may be practically prevented from occurring: bran 44 pounds, oats 22 pounds, and oil meal 12 pounds. From one-half to one pound of this mixture is fed with clover hay. Where possible, roots, silage or other succulent feed, should also be provided. Unless the sheep are quite thin, no corn should be fed.

Furthermore, we do not agree that the feed of ewes that have a tendency to take on fat in January need be cut down. Shepherds of wide experience usually start to feed grain at this time of year, for they know that unless the ewes are in good condition when they lamb their milk flow will be scanty. This results in refusal to own their lambs.

The method of treatment followed by us is practically the same as that advised by the above mentioned authority. A drop of croton oil in a teacupful of raw linseed oil has been suggested as a suitable purge.

F. B. HADLEY,
Experiment Station Veterinarian.
University of Wisconsin.

DYSON'S CONTROL MEASURES FOR ABORTION DISEASE PROGRESSIVE

May I comment as follows on the interesting suggestions of Dr. Dyson in your April issue: We appreciate very deeply the words of commendation from the distinguished veterinarian of Illinois and we congratulate him upon the readiness with which he grasps the fundamental difficulties of the situation; also upon his willingness to break the ice in the matter of infectious abortion legislation. Clearness of vision, loftiness of purpose and boldness in action are necessary for the undertaking.

I would defend the veterinary profession from the indictment of "lack of knowledge concerning a disease so widespread throughout the cattle-breeding areas." Where in the history of veterinary medicine or science in America do we find evidence that there has ever been reposed in the veterinarian that confidence that would have warranted or insured the appropriation of public or private funds for the necessary investigations upon which to base an answer to any of the questions that arise in connection with infectious abortion in cattle? If we indict the veterinary profession it must be for not having merited confidence rather than for not having accomplished a great work with a serious animal disease. I would have your readers believe that our great need is both more highly qualified men in the profession and more support in the efforts of the profession to solve the mysteries of contagious animal dis-

eases and to transform these solutions into effective service.

I believe with Dr. Dyson that we are dealing with a disease universally admitted to be infectious and communicable in ways not well understood, but communicable nevertheless. As a citizen of Michigan it would be quite agreeable to me to have the state of Illinois undertake the control of infectious abortion by mild legislation, such as suggested. The American form of government is essentially experimental and it is only by the various states testing out legislation of this character that we learn what is best to be adopted as uniform regulations for all the states. I prefer not to discuss the merits of the particular suggestion relative to the restricted sale of breeding females supposedly infected, although its defects could be easily pointed out. It impresses me favorably in so far as it is a step in the right direction and it is not a radical step.

The idea of limiting sales to those herds certified to by the state live stock sanitary authorities is, to my mind, the one from which we may expect most in the future; and yet in this connection I see many pitfalls and almost insuperable difficulties as regards its immediate enforcement. Eventually this should be our effective method of preventing transactions in infected animals, but live stock sanitary authorities will certainly demand more accurate knowledge of the disease as a foundation for their efforts before they become very aggressive.

As a general principle I would oppose the suggestion of Dr. Dyson on these grounds: Live stock sanitary legislation or public health legislation in general should never attempt to direct the activities of public servants in detail, but the proper officials should be clothed with adequate power enabing them to promulgate and to enforce regulations respecting any disease or condition that may exist under any set of circumstances. Such a system would demand only the highest type of public officials, only those who could be trusted absolutely. It is to such officials and to such a system that I look for relief in the control of abortion, but not until a vast outlay of money, time, and energy (mental particularly) have been judiciously expended in studying the disease in an effort to answer the many unanswered questions about the disease.

WARD GILTNER.

East Lansing, Michigan.

LAW FOR PREVENTING SPREAD OF ABORTION DISEASE

I have been reading a lot of late about Dr. O. E. Dyson's proposed abortion law. I think the Doctor is all right if in his proposed laws as given in the April number of the Veterinary Medicine he would leave out Sections 1 and 2. I do not think these two sections would prevent the spread of abortion.

Is it not true that a cow can complete her full term of gestation and still be a carrier of the disease? Also could not a cow which had given birth to a live and fully-matured calf six months prior to sale still be a carrier of abortion? If these things are true then I see no need of Sections 1 and 2 in this proposed law. The owner should be forced to make an affidavit certified by the live-stock sanitary authorities of his state, that his herd and premises are free from infectious abortion, and in this way only will the disease be kept from spreading.

Elk River, Minn. J. A. JAEGER.

OBSERVATION ON TREMBLES (MILK-SICK) IN COWS, TRANSMITTED TO MAN BY MILK AND MILK PRODUCTS

On May 29th, 1917, a report was received by the state veterinarian, Department of Agriculture, Division of Animal Industry and Veterinary Science, Springfield, Ill., from a man at Atwood, Ill., stating that he had a sick cow on his farm.

The local veterinarian had been called to treat the case. On making an examination he had been unable to make a positive diagnosis, but thought it might be some form of indigestion and treated the animal accordingly.

The man further stated that his son became ill about the same time that the cow first showed signs of sickness. The son was taken to St. Mary's Hospital at Decatur for treatment and died after

several days' illness. The attending physician expressed his belief that the death was due to some plant poisoning.

That being the case, the father, thinking the boy might have contracted the disease from the cow, asked the Department to make an investigation.

On the 30th day of May, I went to Atwood to investigate the trouble. I called on the local veterinarian who was in attendance on the case, and together we went out to the farm to see the sick cow. We arrived at the farm about one o'clock, and when we went to the barn we found the cow had died a short time before our arrival.

The history of the case, according to the owner, was, that this Jersey cow, age four years, giving a good flow of milk had been kept in a clean warm barn all winter and spring up to May 1st, during which time she had received nothing but dry food. On May 1st, she was turned out to pasture. On the 20th day of May, she began to show stiffness and her flow of milk dropped from three gallons normal to one and one-half pint.

The local veterinarian was called the same evening to see the cow. The symptoms described by the veterinarian in charge were, drooping of head and ears, stiffness, irregular gait, dullness, irregular pulse, respiration slow, temperature about normal, drank water freely, slight appetite, cessation of rumination, eyes glazed, membranes congested, bad-smelling breath and constipation. The diagnosis made by him was some digestive trouble, and the patient was treated accordingly with laxatives and stimulants.

However, the animal did not improve, but seemed to be on the decline with all the former symptoms more marked. On the third day she sought the recumbent position. When forced to rise she did so with difficulty, and with trembling of the entire muscular system. The gait was very irregular, and there was general stiffness. When left alone she would again take the recumbent position and the trembling would cease.

Whenever the animal was disturbed and excited the former symptoms would present themselves. The symptoms became more aggravated until she was unable to rise, with absence of normal reflex, a state of coma gradually ensued, followed by death on the ninth day.

On postmortem examination we found the body still warm with *rigor mortis* complete. The skin appeared quite smooth, the eyes appeared glassy and the mucous membranes showed congestion; membranes of the mouth and tongue were normal. Upon opening the body a peculiar acid odor was detected, the blood was tarry black in color, did not coagulate but rather jellied, lungs and heart normal. The gastro-intestinal mucosa seemed to be slightly congested with the exception of the abomasum. The mucosa of this organ was greatly congested. The contents of the stomach and bowels seemed to be drier and harder than normal with the exception of the abomasum. The contents of the stomach were more liquid than normal (no doubt due to the various drenches the cow had received). The liver was slightly enlarged, showing fatty degeneration; spleen and kidneys normal; bladder contained an abnormally large amount of urine, with a very strong acid odor, yellow in color, specific gravity 1,025, acid reaction.

On investigation it was found that the boy who became sick about the same time as the cow and later died, consumed a great deal of milk, which was taken from the cow before any symptoms were noticed. In fact, the father stated that milk was the boy's principal diet.

The boy's symptoms, as described by his father, were similar to those manifested in the cow: glassy appearance of the eyes, congestion of mucous membranes, dullness, nausea, vomiting, stiffness and constipation.

On the 26th day of May, 1917, a brother of the owner living across the road, became ill. The same physicians were called to treat him. He was treated at home and not taken to a hospital. We went over to see him, but were not permitted to do so. We talked to his wife about the case, and the symptoms she described were: weakness, listlessness, complaint of stiffness, nausea and vomiting spells, breath had a bad odor, and a peculiar appearance of the eyes.

When asked whether he had consumed much milk before he became ill, she said

that he did not consume any, but that he was fond of cream, home-made cheese and butter, of which he had consumed considerable.

The milk products that were consumed by this patient were made of milk taken from two cows that did not show any symptoms of trembles. However, they were kept in a pasture adjoining the one where the brother pastured his cow.

These two cows were taken from the pasture as soon as trouble was anticipated.

The symptoms described by the physicians in charge of the boy that died were: stiffness of the back, a foul-smelling breath, constant vomiting, no rise in temperature, obstinate constipation, pupils dilated, conjunctiva congested, knee jerks were present but gradually became absent. The Babinski sign was marked. A lumbar puncture was made, and the Nonne-Apelt test applied with negative reaction. Urine gave a marked acetone reaction. He refused all food, gradually became weaker, went into coma and died the tenth day.

The symptoms manifested by the boy's uncle were the same as the boy displayed. However, no lumbar puncture was made and no Nonne-Apelt test applied. He recovered after a long illness.

It was further found that there had been a previous case of trembles on this farm. In the year 1915 there had been a sick cow on the farm, which showed the same symptoms as the case reported. This cow died, and its owner also became affected and died. His child also became affected but recovered after a long illness.

The milk and carcass of the cow were fed to hogs which also developed the disease and died.

The pastures where these animals were kept was a twenty-acre timber tract, divided into two ten-acre lots by a wire fence, each used respectfully by the brothers for their cows. The lay of the land was flat with a swail in the north center which was divided by the fence so that each pasture had about the same amount of low land.

There was no domestic grass of any kind present. However, there was a large crop of weeds, such as low larkspur, mandrake, buck brush, burdock, iron weed, poke berry, Indian turnip, poison ivy, horse weed and a number of other plants I was unable to identify.

The interesting feature of these cases, to the writer, is that the same symptoms were manifested by all of the patients.

H. R. SCHWARZE, bacteriologist, Department of Agriculture, Illinois.

IMPACTION OF THE CROP—CROP BOUND

Obstruction of the crop is generally due to swallowing bodies that cannot pass readily from the crop through the second portion of the esophagus to the stomach and gizzard, that is, to an obstruction of the second portion of the esophagus. Hog bristles, small feathers, straw, etc., are usually the cause of the obstruction. Of the cases examined in the author's laboratory some have been due to each of the agents named. Two incubator-hatched and brooder-raised chicks, just beginning to feather, were given potato parings, after which they died. There was found, in each crop, a potato paring, extending from the crop through the second portion of the esophagus into the stomach.

A second cause of impaction of the crop is due to low vitality of the bird; as a result of acute disease, e. g., cholera, or from improper nourishment, the thin muscular walls of the crop may become paralyzed or so weakened as to be unable to force its contents onward into the proventriculus.

Surgical interference is the only treatment for this condition likely to be effective. Having diagnosed the case, it is not difficult to clip away the feathers, clean up the surface with mild antiseptics and with a sharp knife open the crop and remove the obstruction. The crop and the skin should then be sutured, and the bird allowed only soft food for a week.

Where the obstruction is due to a weakened condition of the walls of the proventiculus, its contents may sometimes be forced back through the gullet and out of the mouth by careful manipulation with the hands.

Raleigh, N. C. B. F. KAUPP.

PITFALLS IN CASTRATION

Last spring while out castrating colts I drove into one farm yard where there were two colts to castrate. I castrated the first colt in the standing position without any trouble. I put the emasculator on the cord; the colt threw himself before I could get the emasculator off. He was on the ground, so I just let him fall with the emasculator on the cord, as I have done many times before. When he got up I took it off, and removed the other testicle without any more trouble.

The other colt was castrated in the recumbent position, because he was a high flanker on one side.

The next day the farmer called me up and said if I did not come and stop the first colt from bleeding he would certainly bleed to death. I went out and soon saw that it was not blood, but a serum oozing from the incision on the left side, this being the first testicle I took out when the colt threw himself; the other side was all right. I told the farmer that if the colt did not bleed faster than that he could bleed all his life and not bleed to death. The colt had no fever, so I advised that he be turned out to pasture. The next day I drove by, but the farmer was not at home. I took a look at the colt again. His belly looked considerably drawn, and his temperature was 102.6 degrees F. The serum was still oozing from the left side. The next day the farmer called me up again and said the colt was still bleeding. When I got there and saw the colt from a distance he presented the most perfect picture I ever saw of peritonitis. His temperature was 106 degrees F. and his breathing was labored; his abdomen was much tucked, and he would just stand still in one place and would neither eat nor drink. On making the colt walk, at intervals a clot of blood would fall from the left-hand cut about the size of a small hazel nut. To satisfy the farmer, I cast the colt and packed the left-hand cut with sterilized gauze; at the same time I knew that it was not going to remove the trouble. I knew also that the peritonitis was not caused from infection, as my instruments were sterile.

I left some stimulants and febrifuge, and told the farmer the prognosis was not favorable, and if the colt died, to let me know and we would post him and see if we could not find out the cause of death. I did not hear from the farmer the next day, but the next day he called me up and said the colt was down and could not get up. I told him to let him alone, and to call me as soon as he died, which was the next morning. I went out and on posting I found about one and one-half gallons of blood-clot in the abdominal cavity. On looking further I found that the left spermatic artery was ruptured about half way between its origin and where it goes into the inguinal canal. The internal inguinal ring was also somewhat enlarged. This artery was not bleeding, but had healed. The intestines along the floor of the abdomen showed inflammation.

To this day I have never been able to induce the farmer to believe it was not my fault; and he always says if I had castrated this colt in the recumbent position he would still be alive. He also says he will never permit anyone to castrate another colt for him in the standing position. I castrate around 250 colts every year, and this is the first one I ever lost from castration; and I have it charged up against the standing operation. Hereafter I shall castrate all colts in the standing position or all in the recumbent position on the same farm, and this pitfall will not occur again.

I think the time will come when the veterinary profession will abandon the standing operation. I believe it will redound to the credit of the profession. I am not saying this because I cannot perform the standing operation, as I have in the past used this method almost exclusively. But here is the way it worked with me when I came to this location: A quack here was castrating colts standing and used clamps, for a fee of $1.50 each. He was good at it. After getting $5.00 out West, $1.50 did not look good to me. I saw a lot of the farmers before castrating time and they all told me that if I did not castrate their colts standing, I could not do it for them. They also asked me what my fee was going to be. I thought it over, and then

decided I would go the quack one better even if I lost a few colts the first year. I put the fee at $2.00. When a farmer would ask me my fees I would tell him $2.00. He would say, "Well, that is only fifty cents more and we want to keep you here, so go ahead." Then I would inquire how he wanted it done, and if he did not care, down went the colt; and when I had finished they would say, "That is the best job I ever saw done, and the only way it will be done hereafter." There is more work to the recumbent operation, but one can charge more, and the clients pay the fee without complaint.

The next year I charged $2.50 and got all the colts I wanted. Last year I charged $3.00 for the first one and $2.00 for each additional colt on the farm, and never lost a client because of the charges. I castrated one straight colt last year that I charged $10.00 for, and the farmer never said a word when he paid me. It took about two hours to do the job, as we had to halter-break him first before I could get the harness onto him.

In the standing operation I can do the job if everything is all right and be back in my car in the time it takes me to put the harness on a colt. The standing operation is quicker and easier for the veterinarian, and that is why so many veterinarians get only a fee of $1.00; they don't make enough work out of it. The recumbent position entails more work, but if one gets extra pay that objection vanishes.

JOHN A. JAEGER, D. V. M.
Elk River, Minn.

CASTRATION OF CRYPTORCHID BOAR

In performing this operation, I find it best, but not essential, to have the pig's bowels empty. By the use of short ropes looped around the hocks, I hang the pig up in a good light place. This can be accomplished by driving two spikes into the side of a building, or better still, by hooking the ropes into the hooks of a short single-tree and raising it by pulley or small block and tackle. I then have the assistant steady the pig by holding the front legs. Hanging the pig up causes the intestines to gravitate to the bottom of the intestinal cavity, out of the way. I then clip the hair and paint the seat of operation with tincture of iodin, and make an incision about one-half inch on either side of the median line and about one inch below the bladder, making the incision about three inches long. My hands washed clean in an antiseptic solution, with my two index-fingers, I part the edges of the wound, bringing the testicle or testicles into plain view. They are quickly removed. If both testicles are in the abdominal cavity they can both be removed through the one incision. The wound is then closed with through-and-through interrupted sutures. The pig is then placed in a clean pen or yard. I have never had any bad results from this operation. Those who have not tried locating the testicle by sight should try it and see how easily the operation is performed.

H. HOWARD, D. V. S.
Columbia City, Ind.

CRYPTORCHIDISM TREATED MEDICINALLY

In veterinary practice animals, more particularly horses, in which the descent of one or both testicles into the scrotum has not taken place normally, have always been considered solely from the surgical standpoint. No effort to correct the condition has been made from a medical standpoint. Usually the colt in which a testicle does not come down into the scrotum by the time it has reached the end of its second year of life is considered a confirmed "ridgeling," and a case for the surgeon only.

This is not as it should be if the experience of human medical practitioners can be applied to veterinary subjects. Human beings with an undescended testicle are treated medicinally, and frequently the results are all that can be desired.

There is no very evident reason why veterinarians should not attempt the correction of this abnormality in colts by the use of proper medical treatment.

Just exactly what this proper medical treatment would be is not so plain, but in human subjects some fine results have followed the administration of thyroid

extract. This treatment has been used successfully for defective children.

I would recommend that the same treatment be used in colts. The administration of the thyroid extract should be commenced just as soon as it is evident that the colt is tardy in effecting the descent of one or both testicles.

We have every right to expect good results from this treatment in horses, because everything points to a deficiency of some vital secretion or function in cryptorchids. Ridgelings are really defectives. They are imperfect in physical development and their temperament is usually erratic. These imperfections cannot reasonably be attributed to failure of the testicles to descend normally.

The failure of the testicles to descend in a normal manner is more apt to be due to this defective condition, contrary to popular belief. Just why thyroid extract should be indicated for the correction of this abnormality is not easy to explain, and I recommend it only because it has given good results in similar cases affecting human subjects.

The important item to bear in mind is early diagnosis. To bring good results treatment must begin before the tendency toward cryptorchidism has been made permanent by the development of structures concerned in the phenomenon.

The successful treatment of this abnormality by medicinal means would be of especial value in cases occurring in pure-bred males whose procreative ability is desired.

MART R. STEFFEN.

Milwaukee, Wis.

SUBCUTANEOUS VACCINATION OF HOGS

After reading the article in the April number of the VETERINARY JOURNAL, "Some After-Effects of Vaccination of Hogs," by W. P. Bossenburger, I have decided to give my experience along the same line and the difficulties that led me to follow other tactics, to get away from the grave constitutional disturbances, let it be abscesses, lameness, septicemia, or dead hogs.

No matter how much confidence a client has in you, when he calls you in to see his hogs and they are all well and he wants them vaccinated to save them, and after you get through with the job, irrespective of how it is done, if you have used the deep muscular injection, some die, some won't eat, and some are so lame that they would rather do without feed than to provoke the pain to get it, I can't see for the life of me how a man would stand for it without changing his opinion of you and your treatment.

I know what my opinion of you would be if I were the client, and I think all of you who read this article would feel the same. If our client has a sick animal and calls us in to treat it, in most cases they hold no one responsible for the condition, and we do all that is possible to restore health. On the other hand, if we take a well animal and make it sick, we alone are held responsible for it, which I think is nothing more than fair. (Death following castration is an unpardonable sin, one example.)

I had some serious trouble the same as all of you that are honest enough to admit it, and I decided that if there was no other way of preventing the disease than to have such a bunch of cripples, dead hogs, black looks, and sarcastic remarks from my best clients, I would refrain from vaccination entirely.

I adopted the subcutaneous method, and have just as good results as could be secured with the deep muscular injection, minus all the trouble, dead hogs, etc., and I hold the confidence and good will of my clients, an important feature to the veterinarian.

I consider it impossible to prevent the vibration of the muscle while the needle is being introduced, which is sufficient to cause the trouble while the needle remains. The structure of the muscle is very delicate and the needle not only punctures but lacerates the muscle, due to the fremitus of the muscle, if not to actual contraction. It can very readily be seen that a small particle of the muscle could become detached and act as a foreign body and cause an abscess or other grave troubles. The laceration to the muscle is the cause of the excessive soreness and lameness.

My procedure is the same as the deep puncture, only in the crease behind the ear, and in the upper third, the only

place on a hog that escapes mud and water in most cases. I will not burden you with my results, but they are more than can be expected, in comparison with the deep puncture.

I look for considerable criticism on this paper, but it was up to me to devise new tactics for my clients' interest and to hold their confidence. Give it a trial before condemning it.

C. A. MATTHEW.

Cumberland, Md.

MILK FEVER THREE MONTHS AFTER PARTURITION

I was recently called to see a cow that on the previous morning had given twenty-two pounds of milk and the evening before four pounds. The owner had noticed the cow's unsteady gait, but thought little of it, as the cow was eating well and was fresh three months previous.

The next morning the cow was down, and on arriving I found it lying on the right side with head turned to the left shoulder in the typical milk-fever fashion—temperature 99° with the typical respiration grunt.

A diagnosis of milk fever was given at once in the face of the fact that the cow had been milked almost three months. I asked the owner if he had not put the cow on extra good feed within the last few days and was told that it had been turned on green wheat two days before.

I gave the air treatment and left instructions for the owner to keep the udder inflated. In eight hours the cow was up, and at the last report was coming back to the normal flow of milk.

Dallas, Oregon. J. W. GOIN.

MAGNESIUM SULPHATE TREATMENT OF TETANUS

The following case of tetanus was successfully treated with magnesium sulphate by Capt. W. W. Richards, V. C., N. A., and 1st Lt. Asa R. Andrews, V. C., N. A., at the veterinary hospital, Fort Sam Houston, Texas.

One mule, weighing 1,000 lbs., was admitted to the hospital February 19, 1918, with a well developed case of tetanus: rigid ears, elevated tail, the whole musculature involved; marked extrusion of the membrana nictitans on the least excitement; was able to open mouth sufficiently to prehend and masticate food.

The mule was placed in a comfortable box stall, loose, put on a bran mash diet, drinking water *ad libitum*.

On February 19th, an intravenous injection was made of 4 ounces of a 3 per cent. solution of magnesium sulphate.

February 20th—6 ounces, 3 per cent. solution of magnesium sulphate. February 21st,—8 ounces. February 22nd —3 ounces. February 23rd—No medication. February 24th—8 ounces solution of magnesium sulphate. February 25th—No medication. February 26th—8 ounces solution of magnesium sulphate. February 27th—No medication; able to eat off the floor. February 28th —Such a marked improvement medication was discontinued. March 4th—Placed in corral where he could take voluntary exercise. March 14th—Returned to duty.

No other medication was used except the magnesium sulphate.

MAJOR FRED FOSTER, V. C. N. A.

SOFT CORN POISONING IN HOGS

I was called by one of my clients, saying that something was wrong with his hogs. They had all eaten their feed the night before, but two of them had died during the night and several were sick.

By the time I arrived the third one had died and three more were unable to get up. They were champing their jaws, and drooling, with their noses elevated. Several others were in the first stages of the ailment. They would get their noses through the wire fence, stand and push ahead, and some would start going backward, champing their jaws.

Postmortem examination of two of the dead hogs disclosed some inflammation of the stomach and intestines, and the heart a little soft and flabby. The feed that was in their stomachs (they were moderately full) was well masticated and smelled a little like ensilage.

I killed one hog that was down and about to die, but on postmortem examination it showed nothing different from

what was found in the others, except that at the pyloric end of the stomach I found a handful of food of a bright yellow color.

I found that the hogs had been eating soft corn, badly molded, and slop made out of shorts and shelled corn (soaked); the latter, however, was in good condition.

The owner had just begun feeding this corn five days before I was called. I was called to the farm again the next night to see a sick horse, and they said they had already lost eight hogs, but I have not heard from them since.

I diagnosed the case as poisoning due to the moldy corn. But why it affected them so suddenly, and when nearly a week had elapsed, is what puzzled me. While the corn crop in general was imperfectly matured, it has been fed around here all fall and winter, and this was the first trouble I had heard of its causing. A great many around here bought the soft corn last fall on purpose to feed their hogs, and it did not seem to hurt them. I would be glad to have any comment on this subject through the columns of the Journal.—F. L. E., Illinois.

REPLY: The history, symptoms, and lesions given in any other animal would justify your diagnosis of forage poisoning.

The onset of the trouble five days after the animals had been put on this particular feed was none too soon to expect results from forage poisoning, nor could the suddenness of the attack be accepted as anything like conclusive evidence that it was not forage poisoning.

Until we know more about the disease, or the group of diseases termed "forage poisoning", we are not safe in saying that, because of two feeds that look alike one is dangerous to animals and the other is not, the dangerous feed does not produce forage poisoning. The belief is well founded that mold on feed, although usually present, is but indirectly connected with forage poisoning, and that it is quite possible for feed that appears as bright and clean as the average, to cause forage poising.

Hogs are ordinarily more resistant to the poisonous effects of moldy or fermented feed than cattle, and a great deal more resistant to forage poisoning than horses. Soft corn is much used for feeding hogs and ill effects must be very rare. Nevertheless they are no doubt, to some extent, susceptible to this ailment, and being only slightly susceptible it follows that, out of great numbers fed on moldy, soft corn we might expect only isolated outbreaks of forage poisoning. Still one should be careful to eliminate the more probable parasitisms, and possible infections as well as mineral poisons.

AMPUTATION NECESSARY TO EFFECT DELIVERY

In October, 1917, I received a call to come out at once and attend a cow that had been in labor almost all day. Upon my arrival I found both front legs and nose presented. After vainly attempting to deliver it, it was found necessary to take off both front legs, after which a double-headed calf was delivered. The cow made a complete recovery and was sold at a sale in December. I had the heads mounted and have them in my office.

DR. W. H. ROZINE.

Morenci, Mich.

COUNTY AGENT ACTIVITIES IN THE NORTHWEST!

Mr. R. B. Coglan, county agent leader for the state of Washington, outlines the year's work as follows:

"Thirty-four of the thirty-nine counties in our state now have agents or have taken steps to secure one. County Agent Farr of Snohomish reports that steps have been taken to suppress hog cholera, etc."

Mr. Paul V. Maris, state leader of Oregon, says:

"Other examples of work include vaccinating 6,200 calves against blackleg; 2,454 sheep against septicemia; bringing about the testing of 10,000 cows for tuberculosis."

M. L. Wilson of Montana reports "Over 9,000 calves vaccinated against blackleg, and blackleg control demonstrations given in ten counties."

Professor Hochbaum of Idaho says: "I might give you a few illustrations

of special interest in the fight against diseases. Our agents in Idaho vaccinated something like 25,000 cattle for blackleg. Now this service does not seem very great but when you analyze it you find some good results. The county agent did not do all this himself. He showed them how to vaccinate them; explained the merits of the vaccine, told them how it was to be obtained, talked about some of the other old-time remedies, and how this remedy was the most effective and then turned the syringe over to the farmer and let him vaccinate."

E. T. BAKER.

Moscow, Idaho.

THE PREVENTION OF SELF-SUCKING IN COWS

The habit of self-sucking occurring as it does among otherwise valuable milk cows, is a source of considerable inconvenience to the owners as well as discomfort to the subjects because of methods that are frequently used to restrain the animals. Frequently cows that were good milkers and desirable in every way except for the habit of self-sucking, have been sold for slaughter because owners preferred to make this sacrifice rather than undergo the annoyance of the frequent adjusting of a restraining appliance.

Veterinarians have given some thought and attention to the matter of surgical operations upon the tongue in these cases but results have not been as satisfactory as could be desired.

Dismissing all forms of restraining appliances for the correction of the habit of self-sucking as being impracticable and inconvenient for the owner or attendant and cumbersome or even inhumane for the subject, surgical intervention may be considered as the only practical method for the relief of this condition. Either of two operations may be used to secure the desired result: (1) the removal of a portion of the tongue; and (2) division of the free portion of the tongue. In the first, the methods of procedure—all of which are more or less crude—vary from that employed by the stockman or quack practitioner (which consists in removing part of the free portion of the tongue by means of transverse incision) to the removal of a sufficient portion of the free part of the organ to prevent its being employed as a suction apparatus.

The second operation consists in dividing a part of the free portion of the tongue by means of a median line incision. Various methods have been employed in the performance of this operation, and one, a modification of the original somewhat crude method of splitting the tongue, is to be recommended. This operation (improved) deserves the credit of being called a surgical procedure and positively corrects the condition with a minimum of distress to the subject.

No particular pre-operative preparation is necessary except to handle the subject when its rumen is not distended with food or when other conditions render casting inadvisable. One and one-half to two ounces of chloral hydrate dissolved in two quarts of water and given as a drench twenty or thirty minutes before the subject is cast, serve to narcotize the patient so that practically no pain is felt. Local anesthesia is not very satisfactory. It is unnecessary to employ any special cleansing or disinfecting

Veterinary hospital at Atlantic, Iowa, operated by Drs. V. J. and J. L. Robinson. The residence at the right is owned and occupied by Dr. J. V. Robinson. The hospital is modern throughout, with storage department on the second floor, a good "side game."

agents, except that the extremity of the tongue may be washed with a mild antiseptic preparation such as a 1 to 2,000 solution of formalin.

In operating, a mouth speculum may be adjusted, but this is not necessary. The tongue is grasped and fully drawn from the mouth, at the commissure of the lips on the side that is uppermost, where it is held by an assistant. A soft rubber catheter serves to control hemorrhage when wound about the free portion of the tongue at the point of attachment of the frenum or at a distance of five or six inches proximal to the free portion of the tongue. Grasping the tongue, a sharp pointed operating knife is thrust from below upward through the tongue, traversing the long axis of this organ exactly at its center, dorsoventrally; but on an angle with the mesial plane, so that the points of insertion and exit are about one inch from the median line of the tongue. The knife is then quickly drawn toward the free end of the tongue, taking care to maintain the same angle of incision. This particular method of division of the tongue is for the purpose of producing two flaps; dorsally on one-half of the tongue, and ventrally on the other, so that the mucosa may be drawn over the incised surface and secured by suturing to the end that no muscular tissue remains exposed and that granulation of tissue be reduced to a minimum.

The catheter having been snugly wound about the tongue to prevent hemorrhage, suturing is accomplished, using a No. 3 chromic gut suture, since its removal is unnecessary. In rugged animals a silk or even a linen suture material may be used, but in delicate subjects gut sutures should be employed.

Suturing is begun at the apex of the tongue and continued backward to the point where the cleavage was begun, either continuous or a buttonhole suture being employed. Two strong interrupted sutures are placed on each side of the point of cleavage to control postoperative hemorrhage. The other side of the tongue is sutured in the same manner.

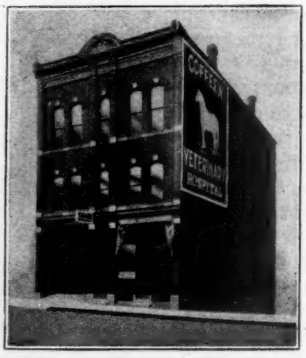
No after-care is necessary other than the administration of a prophylactic dose of antitetanic serum, but in delicate subjects it is essential to give a soft diet and to allow good drinking water *ad lib.* In vigorous animals no apparent distress is occasioned and recovery is usually complete in from ten days to two weeks.

The special advantage possessed by this operation is that it is a rational surgical procedure that may be performed bloodlessly and which is always productive of good results. Its nature is such that dairymen or stockmen will never attempt nor consider crude methods of correction after having witnessed the execution of this particular technic. The operation is of great economic value and is humane in comparison to subjecting animals to the wearing of cumbersome or annoying restraining apparatus. Incidentally a substantial fee is cheerfully paid by the owner of any good cow that may be so treated.

J. V. Lacroix, D. V. S.

SALIVARY CALCULUS REMOVED

Following is a report of a salivary calculus which I removed from the steno duct of a horse. When the horse was purchased by the present owner, in December, 1910, the calculus was about the size of a bean. I advised removal but the owner refused. However, I operated in February, 1917. The calculus was located just opposite the first and second molars on the left side. A twitch was placed on the upper lip and an incision



Dr. Coffeen's splendid hospital at Stillwater, Mich., which he was obliged to rent, in addition to sacrificing a lucrative practice when he went to the aid of Uncle Sam. The doctor is at present in the training camp at Ft. Oglethorpe, Ga.

was made within the buccal cavity and the calculus removed with very little trouble. The after-treatment consisted in flushing the cavity once daily for a few days, using a permanganate solution. Bran mash was given for three or four days, and in ten days the horse was put to work and made a complete recovery. This calculus weighed six and five-eighths ounces.

I removed a small calculus weighing three ounces from a mule, which was driven to my place by the owner who told me the mule had had a cob in his throat for a year. Examination disclosed a salivary calculus. The animal was cast and an incision made in the buccal cavity. The calculus was removed and the mule hitched up again to the wagon. He never lost a day's work. No after-treatment was used and in three weeks the animal had completely recovered.

CURTIS L. IVEY, D. V. S.
San Marcos, Texas.

EAT HORSE*

There are probably several hundred thousand people living in and about Chicago who have no prejudice against horseflesh as food and who would be glad to use it if it could be obtained. Most of these people are from countries where horseflesh is used as food and many prefer it to inferior grades of beef. Just before the outbreak of the war the veterinary inspector of the municipal abattoir at Utrecht, Holland, told the writer that the people there preferred horseflesh to imported frozen Argentine beef. They were then importing horses from England for slaughter at a cost of from fifty to eighty dollars each.

Probably every American who has traveled in Continental Europe has eaten horseflesh and been unable to distinguished it from beef.

The horse is a cleanly animal and is not so susceptible to serious transmissible diseases as other domestic animals that are consumed for food. If arrangements could be made to permit the use of horseflesh for food, it would be a humane measure for it would not then be economical to starve horses until they are useless, as is frequently the case at present. There are large numbers of small horses for which there is practically no market at the present time that would furnish valuable, nutritious and palatable food for millions of people in the United States who like it, and thus make available more beef for the rest of the population who on account of sentiment or prejudice want beef. It would be a relatively simple and economical matter to arrange an abattoir for the slaughter of horses for food under efficient, veterinary inspection both ante- and post-mortem and to provide proper licensed shops where it could be sold. Restaurants, boarding houses or hotels, where horseflesh is used, should be compelled to announce the fact publicly so that no one would be deceived. It is to be hoped our City Council will make arrangements whereby those who wish to use horseflesh that is now wasted will have an opportunity to obtain this nutritious and palatable food. In New York City this has been done and it has been impossible to meet the demand for horseflesh. We are located in the great horse-producing region of the United States and it is almost criminal at this time to permit this great food waste.

Chicago. N. S. MAYO, D. V. S.

*Published in Chicago Tribune, January 25, 1918.

SENTIMENT VS. HEALTH

The following correspondence speaks for itself:

Mr. Horace Hoskins,

I saw in the *Spokesman's Review* a suggestion you made in reference to fighting the scarcity of meat, by substituting beef with horse meat. I want to say in regard to it that if we can't win out in this war without the eating of horse flesh we had better be whipped by the Germans. If you will leave it to the boys who are fighting, I will be safe in saying that nine-tenths of them will feel as I do. Horse meat was never given us to eat, and I for one won't eat it if I know what I am eating, and I know that thousands, yes millions, are of the same mind. I regard a horse as next to human, and at times I think the animal superior to some in good common sense.

A man who will advocate the like has a very weak spot some where, where his brains should be.

I am engaged in the horse and cattle business, and I would no more think of eating one of my horses or a piece of one, any more than eating a piece of you, for I fear you are, anyway half Hun, for that's quite similar to what they are doing, and saying.

Now you have heard what I have to say, or rather a small part of what I have to say, and I know there are many of my same opinion.

Ray E. Libby, Twisp, Wash.

. . . . . .

Mr. R. E. Libby:

Glad to have your views and note your comments on equine meat consumption.

Have you or I the right to say what others should eat in these meatless, wheatless and milkless days?

Have you and I the right to deny access to horse flesh for food to millions of our people, who have been priviledged to buy it in the countries from which they have come?

Have you or I the right to contribute to the fifty to one hundred deaths a day in this great city from pneumonia and a like number from tuberculosis, largely contributed to by an insufficient meat diet, and a dangerous milk supply, because of the high cost of beef, mutton and pork and the diseased dairy herds?

Remembering that equines are almost immune from tuberculosis, have you a right to say that these animals, clean, wholesome and nutritious, for which by the tens of thousands, there is no future in the commercial world? Shall they continue to consume the grasses of the plains and deny the same to sheep and cattle for more rapid maturity?

Will you deny to the wage earner, struggling for an existence, not a competence in old age, these thousands of acres, that should be growing grains, to help feed the 23 per cent of underfed children in New York City, not to speak of the starving millions abroad?

Have you or I a right to inject our personal opinion in these matters, when the World is crying for food and we have it to give, when every acre of forage should be conserved to save human lives at home and abroad.

W. Horace Hoskins.
New York State Veterinary College.
New York City.

EATING OF HORSES NON-AMERICAN

I have noted the advocating of the eating of horse flesh in the Journal of recent issues, but I, as a native born American veterinarian, am not in sympathy with this movement and I believe that I voice the sentiment of the majority of veterinarians and Americans.

The eating of horses and dogs is a foreign custom and it will be hard for us Americans to get the consent of our minds to eat our horses, we are too humane and love the horses next to man.

The veterinarian usually is a humanitarian at heart and a supporter of the humane societies; if not he has missed his calling and is doomed to fail at his vocation.

We as veterinarians should be the last to advocate the killing of horses for food and the publishing of such sentiments in our journals reflects seriously upon us as a profession and will certainly hurt us.

Dr. W. H. Hoskins, evidently has an appetite for the steak cut from his old grey mare, but you and I will gladly let him feast alone.

In the countries where they eat horses and dogs they are very cruel to these animals.

Mark White, V. M. D.
Chicago, Ill.

The majority of the irresolute love to deceive themselves by the delusions which their imagination creates, and thus become only too often the architects of their own misfortune.

Yoritomo-Tashi.

POULTRY SANITATION*

Where any considerable number of birds are brought together on limited grounds, disease is certain to appear among them sooner or later. The greater the number of birds kept on any given area, other things being equal, the sooner

*Reprinted from "Poultry Diseases."

disease will appear, the more rapidly will it spread, and the greater will be the loss from it.

All intelligently directed measures to prevent or delay the appearance of disease in a flock, all sane measures to limit its spread and encompass its eradication, constitutes *sanitation.* Measures, the purpose of which are to cure the sick birds or relieve their suffering, come under the head of *therapeutics* or *therapy.*

On farms of considerable size, where attention is given chiefly to general crops, and but few fowls are kept on a practically unlimited range, the loss from disease may be small, where indifferent or even bad sanitation prevails; but in intensive poultry plants, where the number of birds is large for the size of the range, there can be no continued exemption from devastating epiornithics, if reasonable sanitation is not enforced. Any attempt to operate such a plant in insanitary buildings and yards, or under conditions that do not permit of sanitation, while it may succeed for a time, will result in loss oftener than otherwise and, in the end, must inevitably fail.

Chicago. D. M. CAMPBELL.

TYMPANY OF THE CROP*

This is due to a gas-forming germ, which sets up putrefaction of the contents of the crop. It is usually accompanied by an inflammation (catarrh) of the crop which interferes with its normal function. Birds have been noted to have at times enormously distended crops, which, upon examination, proved to be filled with gas. Usually these crops contain very little feed. This condition often affects young chicks as well as older birds.

Treatment. Give intestinal antiseptics, such as one part of carbolic acid to two hundred parts of water, or mercuric chlorid (corrosive sublimate), one part to ten thousand parts of water, or sulphocarbolates compound.

Immediately temporary relief may be given by liberating the gas through an aspirating needle or a small canula. The crop may then be irrigated, through the canula, with a mild antiseptic solution. Follow with two teaspoonfuls of castor oil and feed sparingly on easily digested food.

B. F. KAUPP.

Raleigh, N. C.

*Reprinted from "Poultry Diseases."

THE SERVICES OF VETERINARY MEDICINE IN THE WAR*

The world war of today has placed important tasks upon veterinary medicine in regard to the treatment of sick horses, the suppression of infectious diseases, and the organization of the military service. The healing art, which during the last few years, through the operation of veterinary and sanitary police, has been somewhat relegated to the background, again comes into its own through the war. Apart from internal and surgical diseases of army horses, the infectious diseases acquire great significance. In the forefront stands glanders. The blood test and the eye test together make it possible, however, to suppress it quickly and surely. By investigations in a horse lazaret for glanders it is now undoubtedly proved that glanders much more frequently heals by calcification of the glanders nodules than has hitherto been supposed.

An invasion from rinderpest and the widely-prevailing parasitic bronchitis in the occupied regions of the north of France should be avoided. Effective measures have also been taken against the piroplasmosis prevailing in Flanders and Macedonia, which is spread by ticks. A disease prevailing in Austria and Belgium since the war, known as infectious bronchopneumonia, which runs an insidious course, and causes a heavy death rate (mortality 12 to 28 per cent), has been favorably influenced by intravenous injections of sublimate solution—a quite new procedure in the treatment of lung diseases. Protective inoculations against strangles were quite ineffective. but curative inoculations by means of large intravenous doses of serum—as in petechial fever (purpura hemorrhagica)—were often successful. Pernicious anemia appeared several times in Flanders and the North of France. Its spread seems to result from insect bites or stings as in piroplasmosis. War ra-

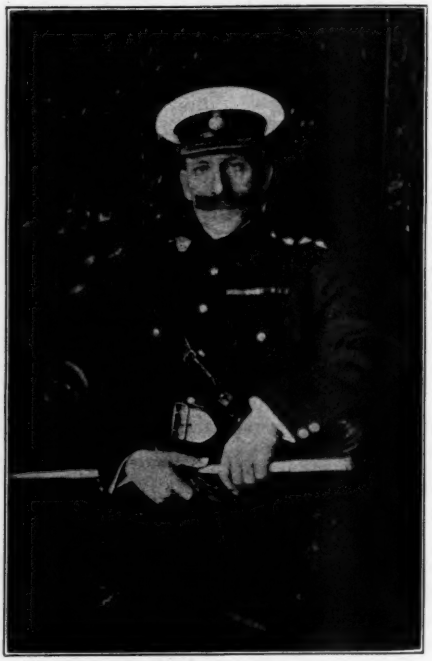
*Reprinted from the *Veterinary Journal,* London.

tions reduced the peace proportion of cases of illness due to overfeeding, and had a rather favorable influence on the condition of the horses. Hay and straw could be quite well replaced by heather (*calluna vulgaris*). [The sequence seems to be only natural.—*Translator.*]

Food poisoning in a great number of cases was noticed. Thus, intestinal catarrh arose from sugar and molasses poisoning; colic inflammation of the kidneys paralysis, laminitis, greasy heels, and other skin diseases coincident with mange were evident. Castor oil poisoning arose from feeding on linseed cake containing ricinus. Characteristic poisonings were brought about by nibbling the untrimmed pine stems from the walls of shelters, and from the taxus shrubs covering the walls of rifle pits. Besides these, white lead poisoning occurred in horses billeted in a white lead factory; copper poisoning after feeding on wheat dipped in blue vitriol; glanders-like nasal ulcers after inhalation of lime in street dust, and similar diseases of the mucous membrane after disinfection of scabies stalls with lime; numerous carbolic, cresol, and petroleum poisonings as the result of the use of impure preparations in the treatment of mange; there were occasional poisonings due to partaking of laburnum, meadow saffron, beech nuts, dogs' mercury and atropa. The copper preparation, optochin, used in human medicine against inflammation of the lungs, leads to incurable blindness; its use in veterinary medicine is, therefore, to be adopted with great caution and only subject to daily use of the opthalmoscope.

Through the war the relations between human and veterinary medicine are brought closer. War surgery has taught the veterinarian much, but human medicine has also gained something from veterinary medicine, especially in the field of the diseases communicable from animals to man. Glanders and mange have frequently been transmitted to men, and many a veterinary surgeon has experienced glanders infection. The relation of symptomatic anthrax of animals to the so-called gaseous emphysema of man is today clearer among doctors than before.

The military organization, bad at first, now includes mobile and immobile horse depots and horse lazarets, glanders and mange lazarets, blood examination stations, carcass destructors, etc. Besides the divisional, army, and chief veterinary surgeons, there is still lack of organizing personnel of the first rank and more especially of an investigator (research conductor) of the highest scientific eminence—a field veterinary chief. —*Eugene Frohmer in Swiss Veterinary Journal.*



Major General Sir Robert Pringle, K. C. M. G., C. B., D. S. O., whose retirement from the position of Director of Veterinary Services has been gazetted, has been in ill health for some time. Graduating at the Glasgow College, in 1874, his career in the Army Veterinary Corps commenced in 1878, and his war service included the Afghan, two Indian and the South African campaigns—in addition to the present war. For services in the Boer War, he was mentioned in dispatches and received the D. S. O. During the present war he was made a C. B., and in January, 1917, received the honor K. C. M. G. Sir Robert carries with him the good wishes of his colleagues that he may recuperate in health on his retirement, and live for many years to enjoy the rest to which he is entitled.—*Veterinary Journal.*

Department of Live Stock Poisoning

By L. H. PAMMEL, Ph. D., Ames, Iowa
Professor of Botany, Iowa State College

Rhododendron Poisoning in Sheep

The *London Veterinary News* of Feb. 16 contains the following interesting item on poisoning from Rhododendron, as follows: "In a Midland district a flock of sheep, attracted, no doubt, by the opportunity of adding to a scanty diet, were poisoned by eating Rhododendron leaves. Four of their number died, eight were killed, the remainder recovering. In connection with those which were killed the important point as to the suitability of the flesh for human consumption was submitted to the medical health officer for decision. It appears that the leaves of several species of Rhododendron possess toxic properties. *Rhododenrum ponticum*, the common form of our woods and shrubberies, is stated to be among the plants whose nectar renders the honey of Trebizond poisonous. The leaves of the less common *Rhododendron chrysanthemum*, a yellow species with a sweet smell, are known to be narcotic since the observation of Statter, a Russian botanist, that a tame deer became seriously intoxicated by browsing on the leaves, and after recovery refused to touch the leaves again. Statter's servants, however, benefited by the lesson, and intoxicated themselves with the leaves without obvious ill-effects. In practice it is pretty clear that no danger to human beings results from consuming the flesh of animals which have browsed on Rhododendron, provided that the flesh is otherwise suitable for food."

The Rhododendron and its relatives are common only in the eastern part of the United States. Two species are abundant in the Allegheny region. The *Rhododendron catawbiense* and *Rhododendron maximum* are abundant in that region. There are also two species in California: the *Rhododendron Californica* and the California azalea (*Rhododendron occidentale*). All of these plants produce handsome flowers. The California azalea is said to contain a toxic substance said to cause poisoning. Some species of azaleas contain the poisonous glucoside, ericolin. I think it is very doubtful that the meat of animals poisoned by these plants is rendered poisonous, as is so often stated.

Fagopyrismus (Buckwheat Poisoning) and Similar Affections

Dr. E. A. Bruce, of Agassiz, British Columbia, has a good paper on "Fagopyrismus." His attention had been called to an outbreak of this erythema of the unpigmented skin. Its production requires: (1) unpigmented skin, (2) ingestion of buckwheat, (3) direct sunshine. A somewhat similar condition may be produced by species of alfalfa, clover, St. John's wort (*Hypericum*) and knotweed (*Polygonum*). The following record is of special interest in this connection: "The symptoms given were as follows: Acting in a peculiar manner as if suffering from brain trouble, they would try to jump out of the enclosure, jump into the air with all four feet off the ground, shake their heads and squeal, then poke their heads against the pen or under a log, then lie quiet for three or four minutes when they would begin again. At times their hind legs were partially paralyzed. In addition, I elicited the information that their skin showed a rash and that they were white animals (Yorkshire). While the feeding of buckwheat was suspected by Dr. Howell, as being the cause, the

[1]Jour. Am. Vet. Med. Assn., N. S., 52: 189-194, Nov., 1917.

true nature of the disease was not realized, as he states that upon the following morning the pigs appeared much better, ate some food, and were turned out on a ploughed field in the hot sun without shelter of any kind. In a few hours they showed the same symptoms as stated above, but not quite so well marked.

Buckwheat appears to be most toxic when in flower. The symptoms are described as follows: "In mild cases there is erythema and slight inflammatory swelling, accompanied by intolerable itching, the region of the head and ears being the most commonly affected. In the severe cases there may be some disturbance of breathing, digestive trouble and symptoms of brain affection. Death may result in twelve hours.

The author notes that common alfalfa in the dry belt of British Columbia, causes inflammatory edema. May I add in this connection that green buckwheat plants in the flowering stage are not the only stage where poisoning occurs. A case was reported to me a great many years ago where buckwheat hulls fed to hogs produced an erythema. Buckwheat rash is commonly reported in man.

Dr. Bruce made some interesting experiments with smartweeds (*Polygonum Persicaria*). This and other species have long been regarded as capable of producing an erythema. His experiments show: "The toxic properties claimed for the knotweeds have not been substantiated by the experiments conducted at Agassiz." In regard to dox (*Rumex*) he says: "I may say that the theory recently advanced by S. Hadwen, that species of Rumex and other acid plants, are responsible for hematuria in cattle after prolonged feeding (usually several years), appears to be well founded.

Industrial Poisoning

Dr. Alic Hamilton[1], who made an investigation of industrial poisoning of those engaged in the manufacture of explosives, states that in 41 plants in the United States, employing 30,000 persons, there were 2500 cases of industrial poisoning, and 53 deaths. Of the 2500 cases, 111 had nothing worse than a fulminate rash. There were 205 cases of anilin poisoning, but not a single case of nitroglycerin poisoning occurred. "Picric itch" is common where picric acid is manufactured. Systemic poisoning from picric acid has long been known to the French, the high explosive melinite consisting chiefly of picric acid. Picric acid is trinitro phenol and is made by the action of mixed acids on phenol.

[1]Jour. Am. Med. Ass'n, 68:1445.

Agaricin

Ethel McCartney[2] in an article on agaricin, states that agaricin is a powerful poison for involuntary muscle, producing a marked and long continued rise of tone. She suggests that this action affecting the muscular tissue surrounding the sweat glands prevents the secretion of the sweat, partly by more or less obstruction and by preventing peristaltic movements and partly by limiting the blood supply. The author suggests that the muscular tissue of the sweat gland may be susceptible, especially, to agaricin as the heart muscles to the digitalis glucoside. Agaricin is obtained from powdered *Polyporus officinals*, "a lichen which grows on larch trees." This organism is not a lichen, but one of the bracket fungi. It would seem that chemists should have a little more knowledge of botany so that such mistakes in identification would not be made.

Digitalis

Robert A. Hatchner[1] states in regard to digitalis: "Among the less important fallacies that have severally contributed to the distrust of digitalis and have been utilized by manufacturers to their own advantage, the following may be mentioned briefly. All drugs, preparations and active principles of this group without exception cause nausea and vomiting in overdoses through their action on the vomiting center in the medulla—not through any direct action on the stomach; hence it cannot be avoided by any mere change in the mode of administra-

[1]Am. Jour. Pharmacy, 90:24-28.

[2]Jour. Pharmac. and Exp. Therapeutics, 10:83-94, f. 1-9.

tion or mere change of preparation, but only by the proper regulation of the dosage, and by dosage I mean the amount which actually enters the blood stream and which alone can act on the heart." He calls attention to a study of the toxic actions of digitalis on the heart by Harold C. Bailey.[2]

Formaldehyd In Diseased Beets

P. A. and Mary Boncquet[3], in a study of oxidases in plants, find it to be most remarkable that an increased amount of formaldehyd occurs in the juices of diseased beet leaves. May there not at times be some connection with this and the cases of poisoning sometimes reported?

TUBERCULIN TEST

(*Continued from page 278*)

cent of all reactors. An intradermal reaction is characterized by a swelling the size of a walnut to one enveloping the side of the tail in the vicinity of the injection, at the expiration of 48 to 72 hours. The reaction may remain for a period of ten days or longer, when sloughing often occurs. The intensity or size of the reaction does not indicate the extent or severity of the individual case.

In regard to the postmorten findings in reactors to any test, you will occasionally have reported a case of no lesions noted even if it be an intradermal or subcutaneous test, but this should not be a discouraging factor to the operator or owner, because 90 per cent of our reactors over the country are killed at public abattoirs where government inspection is maintained, and postmortems are held to determine the fitness of the carcass for food and not in the sense of a searching autopsy. In this connection, I believe that there are many incipient cases of tuberculosis which go unnoticed, and I further believe that a great number of carcasses in this class are far more dangerous than the ones which show the occasional encapsulated caseous or calcareous lesion. Many reactors showing no lesions microscopically on postmortem have shown virulent tubercle baccilli on microscopical examination.

[2]Am. Jour. Med. Sc., 1911:1.

The question has been asked many times—"How do we know that we get all the reactors on any one test?" This we do not know, and in case of a reactor being found in a herd, that herd should be classed as exposed and subsequent tests made to determine the absence of any more reactors. It is common knowledge that some advanced cases will not react regularly, but in the comparative results obtained from the intradermal and subcutaneous tests on over 40,000 cattle tested by the writer in the past five years on public markets, the former test has far exceeded the latter.

Tuberculosis eradication is becoming a national necessity wherein co-operation of all interests is the one point desired. I must say frankly that this co-operation cannot be expected if the temperature or subcutaneous test is to be the accepted test. In the administration of the tuberculin test we have to deal with animal temperament which is very easily aggravated in all breeds of cattle, but more so in the pure-breds of all breeds. The old gentle milk cow is a fit subject for any test in the majority of cases wherein the pure-bred of any of our native beef breeds is not a fit subject for the temperature test. With the intradermal test we are not afraid of the ultimate results on any class of cattle regardless of temperament and other annoying factors which render the temperature test unreliable and inconclusive in a great percentage of cases whereby the intradermal test will come through with just as conclusive a result as can be obtained regardless of the adverse circumstances stated above.

The question of isolation of reactors is a grave proposition for the breeder, veterinarian and sanitarian. In a concerted campaign of eradication of tuberculosis the widespread slaughtering of reactors would work a greater hardship on the pure-bred breeder than any other class concerned. The Bang system of isolation comes nearer solving this problem than anything else. In the case of the dairy cattle, it is coming too close to home to advocate or adopt any procedure other than slaughter. The majority of cases of infantile tuberculosis is charged up against tubercular cows' milk.

Queries and Answers

Use of Title "Doctor" by Non-Graduates Illegal

Among the privileges that the enormous number of nongraduates in the state of South Dakota seem to think that they may enjoy is the use in advertisements, letter heads, prescription blanks, etc., of the title "Doctor" or the abbreviation "V. S."

Is this practice legal? If not can they be compelled to discontinue such practice by obtaining an injunction from the court? C. S. D.

REPLY BY DR. HEMENWAY—Section 19 of the South Dakota statute relative to the State Live Stock Sanitary Board, as amended in 1917, constitutes that Board "examiners in veterinary medicine and surgery." Section 21 provides that "any person desiring to *begin* the practice of veterinary medicine or veterinary surgery in the state of South Dakota, or who shall desire to hold himself out to the public as a practitioner of veterinary medicine or veterinary surgery, *except as provided in Section 27 of this act,* shall make application to the State Live Stock Sanitary Board for license to do so." (Italics ours). The section goes on to say what qualifications the applicant must have, and then says: "Provided that the foregoing provisions, except as to moral character, shall not apply to applicants who have been engaged in the practice of veterinary medicine and veterinary surgery in the state of South Dakota *as a principal business* for at least ten years immediately prior to January 1, 1909."

In section 26 we find a legal definition of the expression "practicing veterinary medicine or surgery," and in the definition we find one using the letters "V. S." in a sign or advertisement and the term "Horse Doctor."

It would seem, taking these sections together, that one licensed under the section relating to those who practiced ten years previous to Jan. 1, 1909, might properly be entitled to the use of the term "Doctor," or of the letters "V. S."

Section 21 does not require a license from those excepted under the terms of section 27. This section thus releases three classes of persons: (1) army veterinarians; (2) regularly licensed veterinarians from other states called into South Dakota, but having no office or appointed place of business in the state; (3) employes or "students under a licensed veterinarian legally qualified to practice under the provisions of this act." With classes 1 and 2 the question asked clearly does not deal. It seems clear that one who advertises himself as a "Doctor" or "V. S." is soliciting patronage for himself as principal; while one who does work as an employe or student of a licensed practitioner does so as the agent of the licensed principal. It appears that this provision was inserted to protect the necessary assistants of the practitioner from prosecution.

A nurse in assisting a surgeon gave for him an anesthetic to his patient, and for this she was prosecuted for illegal practice of medicine. The court held, however, that she was simply his agent, and that the surgeon was administering the anesthetic through the aid of the nurse. So the student, in aiding a veterinarian in an operation, or in administering medicine under his direction, is not himself practicing veterinary medicine or surgery. Such work by an employe or student does not make him a veterinarian, nor entitle him to any designation as such. On the other hand, the use of the designation "Doctor" or "V.

S." in letter head, sign, or other advertisement is a bid for practice as principal, not as an employe or student of another, and it is expressly forbidden in section 26, which makes no allusion to section 27.

Further, if such employe or student prescribes or treats animals in his own name or for fee, even though he give some licensed practitioner a portion of the fee, it would be generally held that he does so as principal and therefore he is not entitled to the protection in section 27.

Granting that the person indicated was not entitled to use the designation "Doctor" or "V. S.," could he be restrained by injunction?

It is doubtful if any court would issue such injunction. Section 29 provides the penalty for violation of the statute, and the punishment is a fine of twenty-five to one hundred dollars, or imprisonment not more than thirty days, or both fine and imprisonment, for *each* offense. Courts do not issue injunctions where other remedies are full and applicable. The proper course to pursue is criminal prosecution.

Readers may remember that the English court did issue an injunction against a veterinary sanitarium, and against the principal proprietor. That injunction was issued because a corporation is not so subject to the criminal law that it could be imprisoned. Injunction was the only remedy available. In the case before us, however, the criminal prosecution presumably offers full remedy.

MORE LIGHT WANTED

In one of the local newspapers I noticed an item regarding a man, who while working in a silo getting out silage injured his knee by nail puncture. He did not regard the injury as serious and continued working about the place for six or eight hours when he became unconscious, and at the time I read the account had been in a semiconscious condition for two or three days.

I was treating a case of so-called cornstalk disease in a horse, at the time, and could not help note the similarity of symptoms of the affection in the man and the horse.

The points that aroused my interest in the case of the man were that the disease was regarded of rare occurrence and did not respond readily to treatment given by the attending physician. Also that the causative factor seemed, as in the horse, to originate from corn. It occurred to me that if the organism that caused the disease in the man is the same that causes cornstalk disease in horses it must be of a very concentrated nature.

One might scrape a few nails in silos to obtain material for experimental purposes in solving the problem.

JOSEPH EMONTS.

O'Fallon, Mo.

REPLY: In connection with your interesting report of the man wounded in a silo, and subsequently presenting symptoms similar to those of forage poisoning, it is of interest to note that at Ottawa, Illinois, cattle recently were dying from a rather unusual type of forage poisoning and an investigation of silage on which they were feeding, revealed contamination by the bacillus botulinus, which was also determined to be the cause of the deaths among the cattle. This is the organism that causes what is commonly known as sausage-poisoning, and is virulent for man.

TETANUS ANTITOXIN AS A CURATIVE AGENT

a. Is tetanus antitoxin of any value in the treatment of tetanus?

b. If useful in human medicine, then why not in veterinary medicine? There is a diversity of opinion in regard to this among veterinarians. Some are firm believers in it and others say it has no curative value.

c. If tetanus antitoxin will produce immunity before inoculation, why will it not then use the same forces to neutralize the toxin after having been formed as in former cases?

d. Is the opposition to its use due to its expensiveness?

e. I had a case of cerebrospinal meningitis to which I might refer. It was one of the severest forms. It recovered nicely and about the time I was going to send it out of the hospital a genuine case of tetanus developed. I used the antitoxin in large quantities from the beginning, as

I always do, and got splendid results. I do not believe the patient could have possibly lived had it not been for that treatment, owing to the weakened condition cerebrospinal meningitis always leaves.

f. I have had hundreds of cases of tetanus and have always been a firm believer in the curative value of tetanus antitoxin. I feel well repaid for having used it. I would like to hear expressions from others who have had wide experience as to what treatment they have found most successful. R. W. Y., Ky.

REPLY: a. Yes.

b. Its usefulness in human and veterinary medicine is subject to the same limitations.

c. Tetanus toxin is a peculiar poison and acts in a peculiar way, quite different from common poisons, as, for example, strychnin. Assuming that four grains will kill a horse in half an hour, five grains will kill in less time, six grains still quicker, and twelve grains in a few seconds (used intravenously). The toxin produced in tetanus would not act in this way. A moderately large lethal dose will kill a horse in five days. A hundred times this amount will not kill it any quicker. In other words, the harmful effects of the poison on the nerve tissues is not noticeable until a considerable time after the damage has been done. This in part explains the varying effect of tetanus antitoxin as a curative agent. It is quite possible, and in many cases without doubt true, that irreparable damage has been done to the nervous system of the horse before the symptoms of tetanus are observed. Such cases of course terminate fatally regardless of treatment. On the other hand, there are cases in which the first damage wrought by the toxin on the nervous system is not severe enough to prove fatal, but additional damage is worked by added amounts of toxin that continue to be elaborated at the seat of infection. In such cases it is presumed that administration of tetanus antitoxin may save the animal by preventing further damage to the nervous system, through an equalization of the toxin as it is elaborated, giving the animal a chance to in time overcome the original effect of the poison and to recover. Thus. experienced practitioners are often able to say when they first see an attack of tetanus that it will prove fatal, and that all treatment is useless, because they have learned to judge from the severity of the symptoms in the first twenty-four hours of their onset, that irreparable damage to the nerve system has already been accomplished by the poison. On the other hand in cases of less severe onset, they cannot say that irreparable damage has or has not been done, and in such cases the prudent man advises the use of tetanus antitoxin to prevent further damage while giving the animal an opportunity to overcome the damage to its nerves that has already been effected. The theory is, and it is supported by careful observation, that the animal's chances of overcoming the damage to its nerve cells that has already been accomplished when the first symptoms appear, are better than its chance of overcoming such damage and such subsequent damage as may occur from toxin continually elaborated at the seat of infection. In other words, the antitoxin is not used for any effect that it may have on the toxin that has already combined with the nerve cells, for it can have no effect on such toxin, but it is used for the purpose of preventing any more of the toxin from reaching the nerve tissue.

d. Only in part.

f. You are having too many cases of tetanus. I should be surprised to learn that tetanus occurs by the hundreds of cases in any locality or in any practice. Look up all the literature you can find on the subject of trismus. Back numbers of this Journal contain many discussions of this ailment. Trismus in mares about to foal and in horses that have been slightly overheated, and perhaps under other circumstances, is not uncommonly mistaken for tetanus.

HEMORRHAGIC SEPTICEMIA OR FORAGE POISONING

Three weeks ago I was called to see a heifer coming two years old. She would rub her head (left side) violently, her eye, ear, and muzzle were badly bruised; she had spasms of the head and neck muscles with clicking of the epiglottis. Temperature 104° F. just after falling. Animals so afflicted fall after

about six hours and die about four hours later.

Postmortem examination revealed nothing except bruises under the skin, self inflicted. Portions of the liver had a parboiled appearance, these portions alternating with healthy tissue.

Blood examination revealed nothing.

A two year old bull in this herd had been found dead the same morning. He had seemed all right the night before.

Two weeks later I was called again to see another heifer with the same symptoms. They remain with the herd until going down. There is no delirium. Please suggest treatment.—F. F., Ill.

REPLY: You may take your choice of names, either hemorrhagic septicemia or forage poisoning, and you will have plenty of good men to back your diagnosis. Prevention is the only treatment worth consideration. A change of feed or hemorrhagic septicemia bacterins are likely to produce equal and entirely satisfactory results.

WHO IS RESPONSIBLE FOR FEES?

When one is called to see a boarder in a public boarding stable at 11:30 p. m. —a case of cerebritis and meningitis— who is responsible for the fees? Is the owner or the stable proprietor responsible, when the stable employes call one in a case of this kind?—J. A. W., Pa.

REPLY BY DR. HEMENWAY: When a horse is left at a public boarding stable, the owner of the stable is bailee, and the owner of the horse is the bailor. (See Essentials of Veterinary Law, Chapter X.) If the horse was sick when left, and it was known by the bailor to be sick, the bailee would not ordinarily be expected to call a veterinarian. But if the horse became suddenly ill it would be the duty of the bailee to notify the owner. If the matter was urgent and there was difficulty in notifying the owner in time, the bailee would be expected to call a veterinarian. Otherwise he would not be using due care and diligence, and would be liable for his negligence. If he called proper professional aid he would not be held for the results, unless the sickness was the result of previous lack of care on his part. If the sickness was due to carelessness of the bailee the bailee would be responsible for the payment of the veterinarian called. If, however, the sickness was not due to previous negligence of the bailee, in calling a veterinarian the bailee should be considered as acting as the agent for owners or bailor, and the bailor would be liable for the payment for the services of the veterinarian. (See also SS 70, 72 and 75 of the "Essentials.")

The servant or employee of the bailee should be held as acting for the bailee, and his act would be considered as the act of the bailee—the owner of the boarding stable.

In point of usage, sometimes the proprietor of the stable might pay the veterinarian and include this bill for services as a portion of his own bill, but in the absence of a previous understanding between the proprietor of the stable and the veterinarian, and in the absence of previous negligence of the bailee, it is difficult to see how the bailee could be held for the veterinarian's fee; but the proprietor of the stable is under a moral obligation to aid in collection of reasonable compensation. He has an advantage in that he has possession of the animal.

INTERESTING CASE OF EDEMA IN THE FLANK

I have never read of any cases of a similar description, so shall call it "serous exudate in the region of the flank." I was called to see a steer which the owner thought had a hernia. On arriving, I found the animal had an extensive swelling on the middle third of the left flank. Palpation elicited no pain, and there were no inflammatory symptoms. Manipulation failed to disclose any opening in the abdominal wall. Exploratory puncture with a horse trocar and canula was followed by no escape of gas, only a little fluid. An incision with a sharp-pointed curved bistoury at the most dependent part of the swelling, released a large quantity of blood-stained fluid. I enlarged this incision in an upward direction for about seven inches, as on inserting my finger it seemed as though this fluid was coming from some cavity located superiorly.

On completely exposing the whole length of the swelling, I found that the underlying muscles were broken down and parts came away like shreds. I curetted the part until I reached healthy tissue, then washed out the wound with a 1 per cent solution of creolin, and treated the whole as an open wound. Healing occurred in about ten days. Instructions were given to syringe out the wound with a 1 per cent solution of creolin twice daily for about a week.

I have seen several similar cases on this island. I am unable to determine the cause of this extraordinary condition, as the owners state that they have never seen the cattle butting at each other. I have seen several animals jabbed by other cattle, but have never encountered this condition before. It apparently is due to some injury to the abdominal wall.

ERNEST F. JARDINE,
Gov. Vet. Surgeon.

Basseterre, St. Kitts, B. W. I.

REPLY: Your report of the case of edema in the flank is interesting. One is led first to think of traumatism, as you suggest, but that it should occur on several animals in the same place seems rather more than a coincidence. You do not mention it, but I am wondering if these animals were corralled with horses and if they may not have been kicked; also if the animals in this herd are dehorned, and thus more apt to butt one another without causing exterior injury than are animals with sharp horns.

TREATMENT FOR COENURUS CEREBRALIS

Please give directions for treating "Grub in the Head" in sheep.

Michigan. W. C. H.

REPLY BY DR. E. T. BAKER—"Grub in the Head" in sheep is about as difficult to treat as "bots" in horses. If this coming summer we could impress it upon the sheepmen that prevention is seven thousand times easier than cure, we will be doing a patriotic service to our country.

Sheep should be given a dark shed to run into when the Estrus ovis attack them, which is usually in the middle of the day. Boring inch and two-inch holes in planks, filling up the holes with salt and smearing the edges with pine tar are good "self-protectors."

For the actual treatment of the condition, one can use any disinfectant or repellent to the larvæ, such as turpentine, creolin, lysol, snuff, coal-oil, oil of eucalyptus well diluted with olive oil.

One sheep owner that I know placed twenty lambs in a tightly closed room, and shook air-slaked lime on the unfortunate animals. When he opened the door, over one-half were permanently cured of grub, and they "never needed any more grub either."

Preach prevention!

SOME EXPERIMENTING NECESSARY IN SHEEP PRACTICE

We have been losing a good many sheep around here, probably due to the long period they have been on dry feed. They stand around listlessly and eat little or nothing; have some temperature, dilated pupils and impairment of vision, but not active symptoms of any cerebral or spinal meningitis. They seem to suffer very little and in a few days or a week, die. I am anxious to get the proper diagnosis of this trouble. Some improvement followed the use of laxatives and tonics, but it did not last.

My small ground work at college has not been followed up by practice and study with sheep, as with horses and cattle, and so I am not qualified to cope intelligently with sheep diseases as with the former, but their present value makes it imperative that one get in line, or conscientiously refuse to treat them. Any information you can give me will be much appreciated.—F. P. C., Ky.

REPLY BY DR. E. T. BAKER: The symptoms you describe are rarely seen among sheep out West, but when they do appear, it has been found that a change of feed, with plenty of exercise, will do more good than medicine. Some act like they were affected with "blind staggers," others like they had parturient paresis or eclampsia. A post-mortem examination of course, conducted immediately after death, might give one a clue to the real cause. We have had as good success with fifteen grains each potassium permanganate and pow-

dered alum in a pint of water, twice daily, as anything. However, the next case we get will receive four grains each tartar emetic and barium chlorid every four hours; this may result in a funeral, but someone must do the experimenting, as the colleges do very little work in sheep pathology.

Sufficient exercise seems too simple for the average rancher to realize its value, and one must insist on the sheep securing at least a mile walk a day; bran and whole oats, with bright, clean hay, plenty of salt, cut out all patent foods, oil cake, etc. for two weeks, and the results are often pleasing. Success in sheep practice demands more of a study of nature than of materia medica.

If this trouble was something like pernicious anemia in horses, sodium cacodylate in three-grain doses, or even quinin and urea hydrochlorid, in one-grain doses, might be tried; of course, these are only experiments.

I shall be glad to hear further from you, and wish you success in sheep practice, for it is practically a new field for the American veterinarian.

WAS DEATH DUE TO FORAGE POISONING?

I have had a couple of cases in the last month that have puzzled me more than any I have had since I have been in practice. On February 14th, I was called fourteen miles to see a gray mare in good flesh running idle, being fed oats, timothy hay and corn and with access to a pile of oats and wheat straw which looked good, and water from a well. The mare had a temperature of 106°, was not apparently in any misery, she breathed a little fast and on moving wabbled a trifle behind; there was no soreness over the kidneys; lungs in good shape; bowels natural and eating some. I gave a mixture of iron, quinin and strychnin. She laid down in the afternoon and got up all right, but fell over dead at four o'clock. She had no cough and there was no discharge from the nostrils.

I was called yesterday to the same farm to see a bay horse in the same condition, standing in the barn, breathing a little heavily, and eating some but not much. It had worked the day before on a pulverizer with three others; bowels active, temperature 106°. I let it out of the barn and it wabbled somewhat behind. I gave the same medicine as before. The horse ate and drank some water that day; and I gave medicine up to two o'clock that night. It seemed better and got up the next morning and we gave it some of the oats. I went out in an hour or so and found him dead. The surroundings showed no indication of the animals having struggled. Postmorten showed that the stomach had considerable feed in it; bowels in normal condition, but one-half of the liver was twice its natural size and hard as a piece of leather. On cutting it open I found that it was dark in the center. I would like to have these cases discussed. There were no dark places on the left side where the liver lay to indicate that the animal had been kicked, and the client said none of his horses fought each other. If you can give me any light on these cases I would appreciate it. It is evident that the mare that died was afflicted the same way as the last one, and my client is alarmed and fears further loss of some of his valuable horses.—C. B. Ill.

REPLY—I cannot make anything out of your case report other than a form of forage poisoning, which under the circumstances cannot be very sure or very satisfactory.

If all the feed appeared good as indicated in your letter, I should eliminate the oat and wheat straw from suspicion.

I cannot bring myself to believe that death resulted from the lesion found in the liver, or that the high temperature was due to inflammation in this organ. The condition you found was evidently a chronic one, and excepting for the high temperature there was no symptom of liver involvement, while the locomotary involvement, temperature and dullness indicate affection of the central nervous system, and such an affection as one would expect; first, in forage poisoning; second, from parasitic invasions; or a third from a new-growth.

Can any of our readers shed any light on these cases?

AFFECTION OF OVARIES INDICATED

I have a cow which is continually in "heat." The condition has been present for four weeks, and I wonder if this is due to ovarian trouble. Is there any treatment for this? H. E. B., Ind.

REPLY: It would seem that there is little doubt but that the animal mentioned is suffering from an affection of the ovaries. We would suggest an examination of these organs. It is possible that one or both are cystic. If so, possibly the cysts may be ruptured by squeezing the ovaries through the rectum, and with the rupture the trouble will probably disappear. If you are unable to accomplish anything in this way oophorectomy will be indicated. This operation offers little difficulty, and is not considered serious.

ARMY CORPS MISCELLANY

(Continued from page 282.)

have given up profitable practices at home have found their practice being snatched by officers of the veterinary reserve corps who have sought commissions in the corps with the double purpose of escaping the draft and of being permitted to remain at home and profit by the military service of others. It is the policv of Surgeon General Gorgas that no opportunity shall be given one member of the profession to profit by the military necessities of another where anything in the administraton of the department can prevent it.

RECENT APPOINTMENTS, PROMOTIONS AND ASSIGNMENTS

Majors

Veterinary Training School, Camp Lee, as instructors: Majs. Ackerman, E. B., and Griffin, G. E.

Schwarzkopf, Maj. O., to Ft. Snelling, and by letter to Central Dept.

Foster, Capt. R. J., and Stokes, Capt. W. F., promoted to be majors.

Captains

Hickman, Capt. T. S., to Charleston, S. C., animal embarkation depot; Holton, Capt. D. J., to Camp Doniphan with Remount Depot No. 327; Teeple, Capt. S. L., to Ft. Oglethorpe Med. Offs. training camp for inst.

Promoted to be captains: Wright, 1st Lt. J. L., Mahaffy, 1st Lt. J. R.; Butler, 1st Lt. F. E.; Drayer, 1st Lt. J. H., Hofferd, 1st Lt. R. M.; Lynch, 1st Lt. D. J.; Eakins, 1st Lt. H. S.

Courtright, Capt. J. M., to Remount Depot at Camp Greene; Townsend, 1st Lt. N. L.

Grutzman, Capt. W. R., will report to Cmdg. Off. at Ft. D. A. Russell.

Conn, 1st Lt. G. H., to Camp Hancock.

Porteus, 1st Lt. R., to Camp Gordon.

Hinkle, 1st Lt. T. B,. and Hoyt, 1st Lt. D. M., to Camp Greene in remount depot.

Lamb, 1st Lt. M. B., to Camp Lee as Vet.

First Lieutenants

Buck, 1st Lt. F. LeR., N. A., to Camp Meade in Remount Depot; Howie, 1st Lt. T. B., to Camp Doniphan; Homer, 1st Lt. H. Z., to Camp Shelby; Torgersen, 1st Lt. H. E., to Camp Cody; Malchiorsen, 1st Lt. W. G., to Camp Grant.

Following promoted to be first lieutenants: 2nd Lts. Derivan, J. F.; Elson, R. E.; Moye, R. A.; Armstrong, G. C.; Croll, F. B.; Dierks, W. R.; Essex, J. J.; Frederick, H.; Fry, C. L.; Johnson, J. C.; Laing, E. J.; Schrock, E. D.; McClellan, J. B.; Austin, F. M.; Temple, E.; Hallar, F., and Butler, F. E.; Keck, W. C.; Barstow, I. L.; Hughes, W. O.; Beckner, P. C.; Humphrey, F. M.; Kord, C. E.; Friedline, L. M.; Chew, R. D.; Holmes, H. R.; Kendrick, L. R.; Messmore, H. L.; Marbry, L. E.; Stull, C. N.

Bailey, 2d Lt. W., veterinary department of Signal Corps promoted to be 1st Lt.

Second Lieutenants

Ozenberger, E. W., to auxiliary remount depot, Camp Lee, for duty; Allen, E. S., to Camp Lee and report to commanding general; Doty, L. J., McCahan, W. R., Williams, W. T., to Fort Bliss, Tex., auxiliary remount depot; Kepp, L. J., to Camp Forrest, Ga., as meat inspector; Chase, 2d Lt. C. S., to Ft. Myer; Smith, 2d Lt. G. M., to Camp Sherman.

Following to Camp Forrest: 2nd Lts. Adams, C. R.; Brown, F. E.; Hunter, J. N.; Moye, K. J.

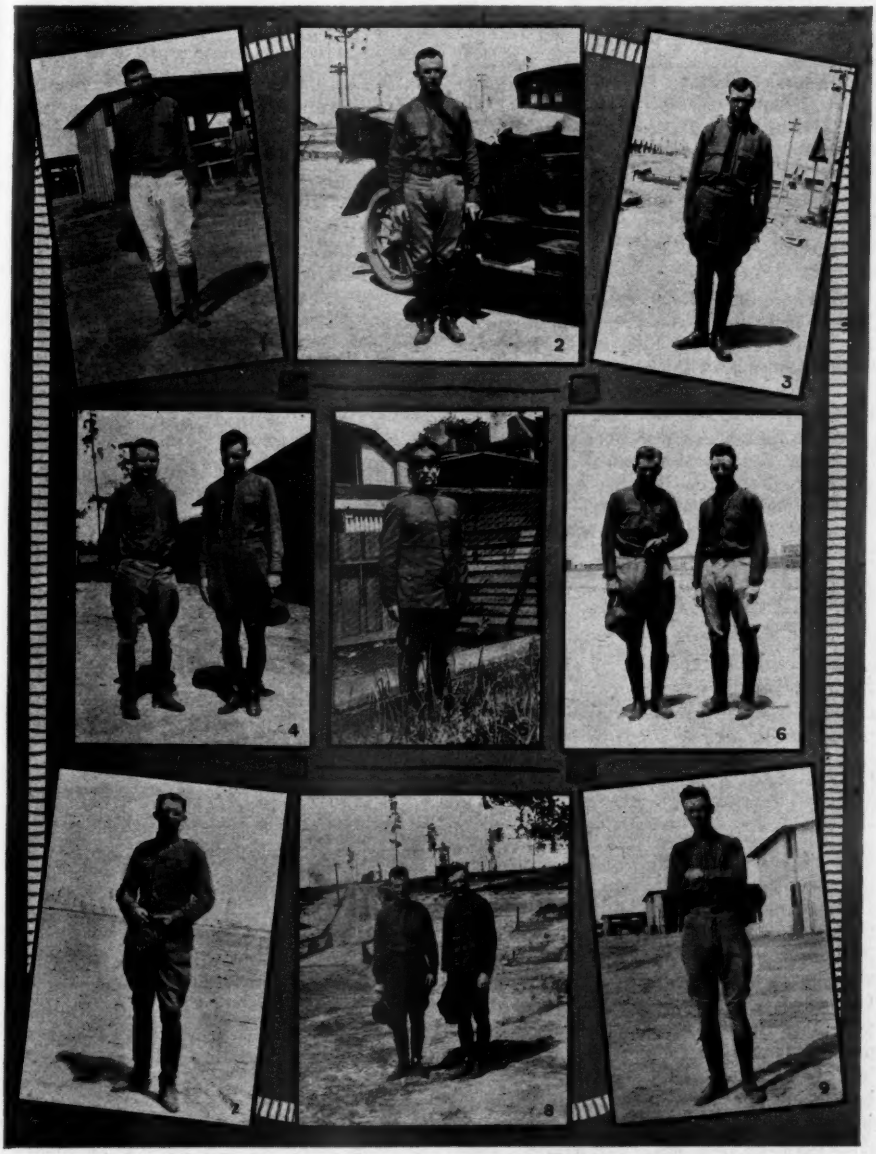
Kerr, 2d Lt. J. M., to Camp Sheridan with Aux. Remount Depot; Policoff, 2d Lt. W. W., to Chicago as Asst. Depot Qm.

Mosley, 2d Lt. to Ft. Oglethorpe; Doerr, 2d Lt. J.; Peterson, 2d Lt. L. N., and Schroeder, 2d Lt. E. F., to Camp Dix Aux. Remount Depot; Muller, 2d Lt. J. H., to Camp Upton, with Aux. Remount Depot; Alexander, 2d Lt. O. C., to Camp Meade; Humphrey, 2d Lt. F. M., to Front Royal, Va., Remount Depot, for temp. duty; Elliott, 2d Lt. G. H., R. C., to Camp Bowie; Moon, 2d Lt. G. W., to Camp Dodge; Devita, 2d Lt. J. G. M., R. C. to Camp Devens, with Remount Depot 301; Clark, 2d Lt. G. W., R. C., to Camp

Lewis; Coffeen, 2d Lt. R. J., to Ft. Riley; Bibens, 2d Lt. D. H., to Camp Bowie, thence to his station; Brecheisen, 2d Lt. A. A., hon. discharged.

Following to Camp Doniphan: 2d Lts. Kutz, H. C.; Reed, C. W. Jr.; Reinhardt, R. R.; Siereveld, M., Jr.

Gilfillan, 2d Lt. J. E., to Camp Beauregard; Warden, 2d Lt. C. E., to Camp Joseph E. Johnston, with Remount Squadron No. 306;



1. Lt. B. E. Dappen, Camp Shelby, Miss.; 2. Lt. G. B. Huse, 4th Field Artillery, Camp Shelby; 3. Lt. Chas. C. Dobson, Camp Shelby; 4. Lts. Magney and Petry, Remount Depot, Camp Shelby; 5. Lt. F. W. Hurben, formerly of Kansas City, now doing inspection work with headquarters at Meridian, Miss.; 6. Lts. H. Z. Homer and A. D. Martin, Camp Shelby; 7. Lt. J. M. Casey, Camp Shelby; 8. Lts. Boswick and Carter, Camp Shelby; 9. Lt. A. A. Austin, Camp Shelby.

Royal, 2d Lt. A. J., to Camp Greenleaf for inst.; Meeks, 2d Lt. R. B., to Camp Joseph E. Johnston, with Remount Squadron No. 305; Denton, 2d Lt. R. D., to Hoboken; Egan, 2d Lt. P. I., to Camp Kearney; Cleaver, 2d Lt. F. E., to Camp McClellan; Kiff, 2d Lt. W. J., to Camp Greenleaf for inst.; Baker, 2d Lt. B. B. and Yoger, M.; Houchins, 2d Lt. J. R., and Sevey, 2d Lt. A. M., Jr., to Chicago for inst. in meat inspection; Burns, 2d Lt. J. R. to Camp Greenleaf for inst.; Brackbill, 2d Lt. M. LaF., to Camp Hancock; Drayer, 1st Lt. J. H., to Aux. Remount Depot at Camp Grant.

McLaughlin, 2d Lt. C. W., to Camp Greenleaf.

Brotheridge, 2d Lt. H. J. to Camp Wadsworth.

Boyer, 2d. Lt. T. R.; Hughes, 2d Lt. E. C.; Jansen, 2d Lt. J. F., and Pruett, 2d Lt. H. B., to Camp Beauregard; Fish, 2d Lt. L. O., to Camp Johnston, with Remount Squad, No. 307; Olney, 2d Lt. J. F., to Camp Johnston, with Remount Squad, No. 308.

Second Lieutenants in Veterinary Reserve: Nettleton, E. N.; Morrison, R. R.; Cloud, P. W.; Keller, D. F.; Burnets, P. H.; McMillan, C.; Low, F.; Walsh, Harry P.

THE LAST COMMENCEMENT AT THE KANSAS CITY VETERINARY COLLEGE.

With the commencement held April 23, the Kansas City Veterinary College ceased to exist as an educational institution. The decision to discontinue the institution was reached some weeks ago, but the announcement was not made until after the close of the school year.

The Kansas City Veterinary College has played a tremendously important part in the affairs of the veterinary profession of America, which includes more than 1,700 of its graduates, a number greater than the alumni of any other veterinary school in the United States. On the whole they have made good in practice, in federal service, in state and municipal work. Their ideals have been high, and more than any other similar body they have been association men; in the districts where they have gone in considerable numbers, veterinary associations are notably large and active. This has meant much for the uplift of the profession, and has been a direct result of the influence of this institution.

The K. C. V. C. has been always largely in a class to itself; it has maintained its own entrance, matriculation and graduate requirements to a considerable extent independent of the standard fixed by the A. V. M. A. and the B. A. I., yet there has never been a question raised in either as to whether these standards met the requirements. The equipment of the school has always been ample, even for classes as large as those attracted to it, and it enjoyed the distinction of having on its faculty the highest paid instructors of any veterinary college anywhere, state or private, and of paying veterinary instructors the largest total amount for instruction of any veterinary college. Further, it was the largest private school of any kind not endowed and not supported by public funds in the United States, and probably the largest in the world.

Naturally with a record and with traditions such as these, there was much concern over its discontinuance, and this action was taken only after the fullest consultation with many representative alumni of the school, and it had the unanimous approval of all those consulted.

When the future of the school was being considered by the directors and representative alumni it was pointed out that the school had always expended the full amount received from tuition upon maintenance, and that the conditions brought about by the war had decreased the attendance at all schools, veterinary as well as others, 30 per cent or more, and the present standard of the institution absolutely could not be maintained from the attendance to be expected during the continuance of the war and probably not for some years after its close. It was unanimously agreed that whatever the exigencies of the times might require, the school could under no circumstances lower its present standards of entrance or the quality of its instruction, or in any way bring discredit upon its own unexcelled record or upon its alumni. It was further shown that the country would not be likely to suffer from its discontinuance,

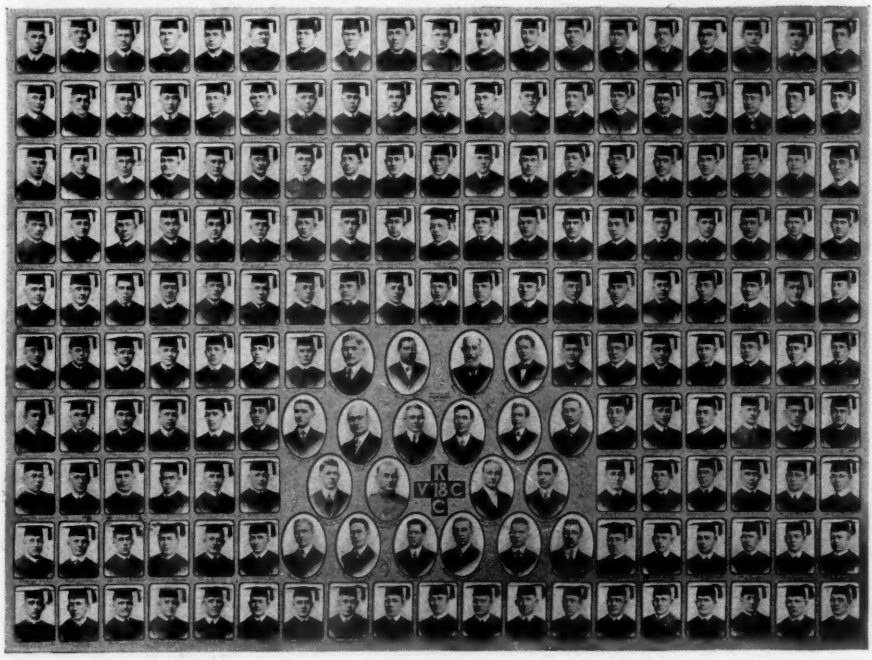
since in the territory chiefly supplied by it two state agricultural colleges had within a year inaugurated regular four-year courses in veterinary medicine, and that the state university of another state had made a beginning by establishing two years' work in veterinary medicine, and in view of this condition it seemed the only thing to do to discontinue at once, while its record was untarnished, its prestige unimpaired, its work largely completed and its need largely filled, and when it was graduating the best qualified class and, with one exception, the largest in its history—a class of 161 young men upon whom the degree of Doctor of Veterinary Medicine was conferred.

Of the sixty-eight underclass men, sixty met the entrance requirements of the state schools and all, or nearly all, will complete their course at the Kansas Agricultural College at Manhattan, where they will be given full credit for the work already completed. The remaining eight will probably continue their course at some private veterinary college.

PROFESSOR LIAUTARD DIES IN EIGHTY-FOURTH YEAR

Alexandre Francois Liautard was born in Paris, February 18, 1835, and died at Boise Jerome, France, April 20, 1918.

Professor Liautard was graduated from the Alfort Veterinary College in 1856, and from the University Medical College, New York City, in 1865. After leaving Alfort, Professor Liautard served three years in the French army and then emigrated to New York, where he began the practice of his profession in 1860. He at once undertook the reorganization of the New York College of Veterinary Surgeons, of which he became dean, and professor of anatomy and operative surgery, serving in that capacity for fifteen years, when he severed his connections with the New York College of Veterinary Surgeons to organize and assume like duties in the American Veterinary College, continuing until the amalgamation of the two schools as a department of New York University in 1899. At this time, after an active professional career of forty-three years, he retired and returned to



The 1918 graduating class and faculty of the Kansas City Veterinary College.

France, "to end his days amid peaceful scenes," as he put it. That the end should have come during the present holocaust in his native land illustrates the irony of fate.

In 1863 Professor Liautard was one of the organizers of the United States Veterinary Medical Association, the precursor of the present A. V. M. A., and served as its first secretary. He was president of this association from 1875 to 1877. During the latter year he undertook the editorship of an official organ for the association, and continued to serve in that capacity for four years, when the association decided to discontinue the publication of an official organ, and the publication and property was presented to Professor Liautard, who continued its publication as the *American Veterinary Review*. On the retirement of Professor Liautard in 1899, the business management of the "Review" passed to Dr. Roscoe Bell, and on the latter's death to Dr. R. W. Ellis; but Professor Liautard continued to serve the "Review" as senior editor until its suspension in 1915, a period altogether of thirty-nine years. Since the passing of the "Review," Professor Liautard has been a regular contributor to the *Journal of the American Veterinary Medical Association*.

Professor Liautard was the author of several veterinary text books which were largely used by students in former years. He was an honorary F. R. C. V. S., and was decorated by the French government as *Chevalier du Merite Agricole* in 1884. He is survived by a daughter.

Veterinarians now at the training camp at Camp Greenleaf, Ga., Captain Stokes in command.